Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME VIII.] NEW-YORK, APRIL 9, 1853. [NUMBER 30.

THE
Scientific American,
PUBLISHED WEEKLY
At 128 Fulton street, N. Y., (Sun Buildings)
BY MUNN & COMPANY.

Hotchkiss & Co., Boston.
Dexter & Bro., New York City.
Stokes & Bro.. Philadelphia.
G.J. LeCount & Strong, San Francisco, Cal.
Cooke, Kinney & Co. ditto.
B. Dawson, Montreal, C. E.
M. Boullemet, Mobile, Ala.
E. W. Wiley, New Orleans, La.
E. G. Fuller, Halifax, N. S.
M. M. Gardissal & Co., Paris.

Responsible Agents may also be found in all the principal cities and towns in the United States.

Terms—$2 a-year—$1 in advance and the remainder in 6 months.

USEFUL RECEIPTS.

To make Crystallized Soda Alum.

Take 200 lbs. of kaolin, or any other aluminous clay in powder, and 70 lbs. of salt, dissolved in 100 parts of water to mix with the former; the water is evaporated in a lead basin, and the mixture carried to a reverberatory furnace heated to a dull red color. After an hour's exposure in the fire the clay is taken out and treated, while hot, in lead basins with double its weight of sulphuric acid at 40°; the precaution being taken not to prolong the operation, or there would be danger of the lead melting. The yellow magma thus obtained is placed in a reverberatory furnace, where it is heated from 200 to 250° (centigrade), until it becomes white; it is then taken out and treated with water in a leaden boiler. The soda alum is easily dissolved, and in the course of a few hours, when the liquid has entirely settled it is poured off by means of a syphon and concentrated, it is afterwards transferred into reservoirs, where it crystallizes at the end of the second day. The calcined earth might likewise be treated immediately with sulphuric acid, and the salt added only a short time before the end of the operation. But the first-named process is preferable. Whatever process is employed chlorohydric acid is disengaged, which, in a manufactory of any size, ought to be collected by the same means as is employed for the purpose in the manufacture of soda.

To Cure Warts.

Take half an ounce of sulphur, half an ounce of 90 per cent. spirits, put into an ounce phial, shake them well together, then freely apply to the affected parts, or warts, for a few days once or twice a day, and in a few weeks or months at most the warts will disappear. Try it. And so with corns in like manner.—[Exch.

[Warts can be cured by washing them with a solution of soda, and allowing it to dry on them.

Superiority of American Wool.

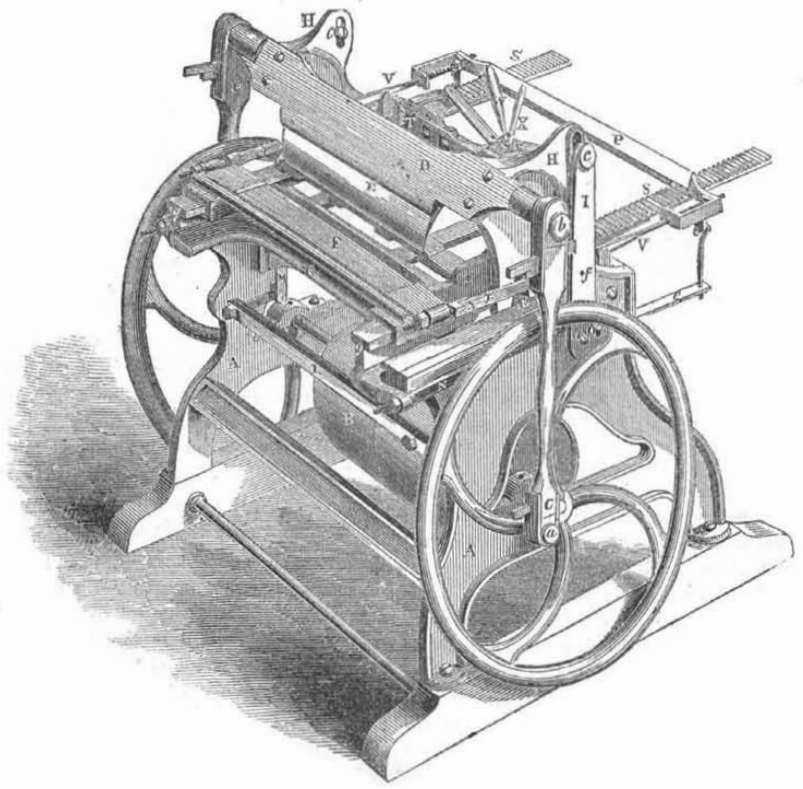
According to the following, from "The Economist," the United States can produce the best wool of any country in the world:—"By recent scientific researches on the part of Peter A. Browne, Esq., of Pennsylvania, it has been established that the United States can outrival the world in wool as in cotton. Thus, Spanish sheep yielding naturally wool 2,000 to the inch, carried to England, degenerated to 900 to the inch, and brought to the United States recovered to 2,100, or finer than the original. The fact being once established that our soil and climate produce finer wool than other countries, will give to our manufacturers invariably the superiority in cloths, if the manufacturer is allied in his interest to the grower.

Signals.

The lamps used on railroads in England are of three colors—red, to signify danger; green, to denote caution; and white to indicate safety. Applied to trains in motion, white applies that full speed may be attained; green, proceed slowly; red, stop.

IMPROVED STAVE CUTTER AND JOINTING MACHINE.

Figure 1.

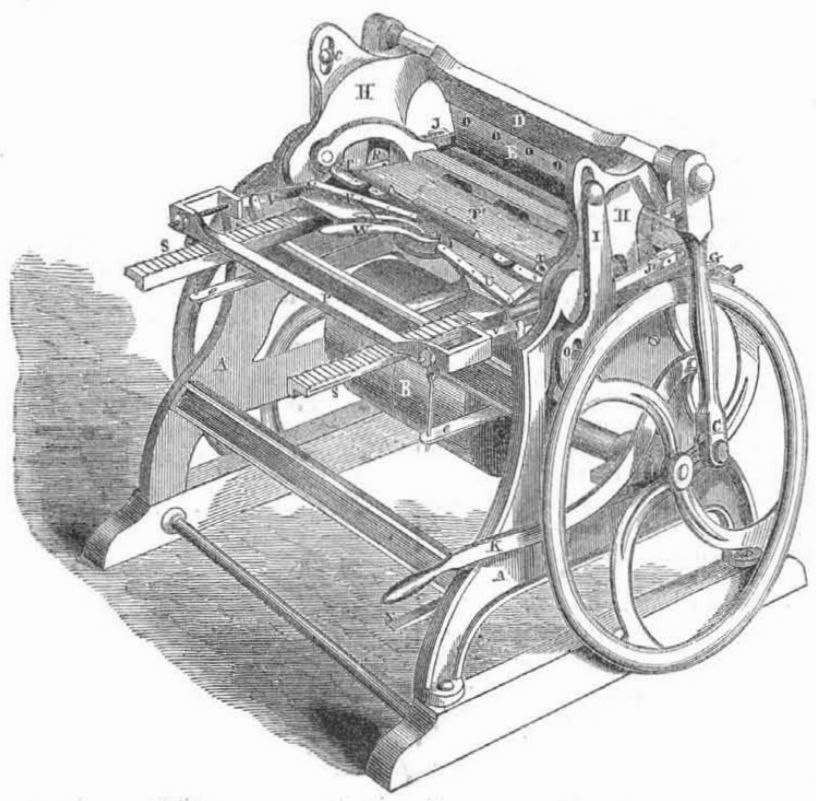


The annexed engravings are perspective views (figure 1 a view in front of the knives, and figure 2 a view behind the knives) of an improved machine for cutting and jointing staves, &c., invented by Charles Mowry, of Elbridge, N. Y., and for which a patent was granted in May 1849; since that time it has been improved in various particulars, as represented in the annexed figures. The assignees of the patent with the exception of New York State, are Messrs. Gwynnes & Sheffield, of Urbana, Ohio.

For this machine the logs are first sawn into plank about 4½ inches thick, and then cut into bolts the desired length of the stave.—The bolt is softened by steam or warm water, then placed on the machine and cut and jointed while warm.

A A are the standards of the frame of the machine, and B represents a fast and loose pulley on the main shaft for driving the machine by a belt, and for setting it free when required; C is a connecting rod attached to the crank pin, *a*, and to the wrist, *b*, of the knife stock, D; E is the cleaving knife. (There is a fly-wheel, connecting rod &c.

Figure 2.

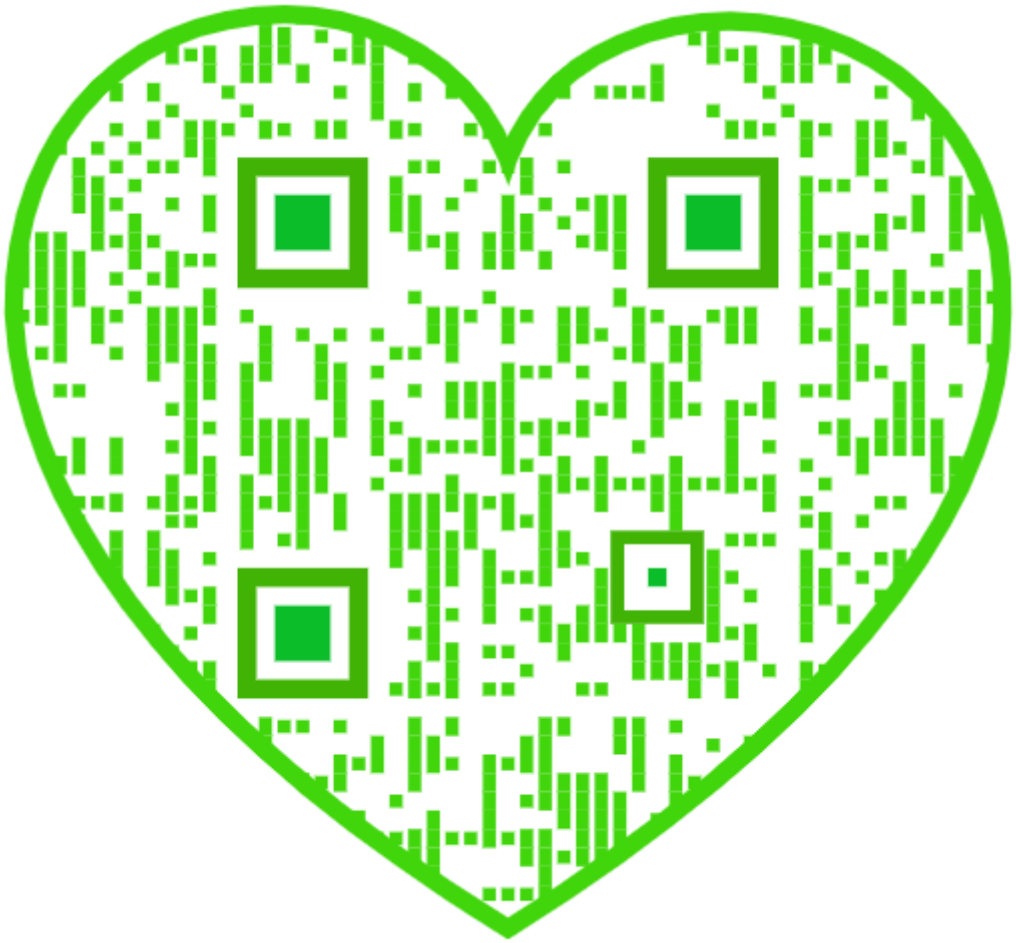


on each side—the one a duplicate of the other.) The knife, E, receives a vibratory motion, and describes a vertical curve; *d* is the journal on which the arm, I, vibrates; *c* is a pin passing through a slot in the back of shoulders, H H, of the knife stock, D. The said shoulders are fixed on journals to allow the knife stock to vibrate, when the rod, C, moves up and down to raise the knife, E, and bring it down again upon the bolt of wood to be cut into a stave, &c.; F and G are the two stocks of the jointing knives, the separate operations of cleaving the stave and jointing it being performed through the agency of the same connecting rods. The jointing knives have a horizontal motion, and are placed one above the other; the arms that move them receive a vibratory motion as follows; *f*, figure 1, is the pivot joint of the rod, J, belonging to the upper jointing knife, F. As the arm, I, is moved through the agency of pin, *c*, working in the slot of shoulder H, as said arm vibrates, the rods, J J, are moved in towards and from the bolt to joint the stave.—The lower jointing knife, G, has the inner ends of its rod, N, hung on pivot joints in the sides of the frame, and the pin, O, (one on each side,) projects through the slot in the lower part of the arm, I. When the said arm is vibrated, the lower jointing knife will therefore receive the same motion as the upper one. These knives are made to cut the proper taper; *g g* are rails on which the guides of knife, F, slide. We have thus described the motions of the cleaving and jointing knives. We will now explain the feeding operations. Reference especially made to figure 2. T' is the bolt of wood to be cut into staves. It is placed on four iron bars, running lengthwise of the machine. The feed carriage comes up behind the bolt and pushes it forward to the knives; T T are toothed clamps which have teeth that take into the ends of the bolt to hold it firm; U U are the levers that work these clamps. They are operated by the lever, W, which works the circle plate, to which the inner ends of levers, U U, are attached. The lever, X, is merely a wrench to screw the circle plate fast when the bolt is clamped; S S are the two racks of the feed carriage, and arms V V, and pall P is the feeder. The arms, VV, are secured on vibrating heads, R R, (one on each side) secured on pivots in the sides of the frame, and they have pins projecting through curved slots in the shoulders, H H. When the shoulders, H H, vibrate, the pins at R, in the slots, are so acted upon as to move the arms, V V, back and forth, and thus make the broad pall, P, take into the racks, S S, notch after notch, and push them forward one notch for every stave to be cut. The bolt to be cut into staves passes under a guide plate or swinging bridge behind knife, E, in figure 2. When the bolt of wood is all cut up, by bearing down on lever, Z, (letter turned) it throws up the pall, P, and allows the feed carriage to be moved back for a new bolt. The lever, Z, therefore regulates the feed motion.

The upper jointing knife can be raised so as to regulate its position for staves of different sizes. In figure 1 L is a bar in front which vibrates in bearings in the frame, and is attached to suspended arms, M M, which are jointed to the swinging frame in which the knife stock, F, is placed, and also the guide bridge behind the knives. The lever, K, fig. 2, is attached at one side to the bar, L, figure 1, and works it, therefore, by moving the lever to any desired point, up or down, the upper jointing knife is placed so as to set the knives for operation, for staves of different widths; *e e* are simply screws working in bars, and are employed to make the pall, P bite in the rack. The jointing knives act before the descending knife, E, and when they recede the said knife descends, cleaves out the stave, and it is then finished. The machine, although it may appear complicated, is really not so; a close attention to the figures and description will render its operations plain. It cuts and joints 100 staves in a minute. We have seen a number of staves which were finished in one of the machines, and we can speak in the highest terms of their neatness and finish. There are 20 of these machines in successful operation.

For further information see advertisement on our advertising page.

© 1853 SCIENTIFIC AMERICAN, INC



MISCELLANEOUS.

The New Bible House.

The above building, which is situated in the upper part of this city, and has been erected by the American Bible Society from the want of sufficient accommodation in their present abode, is the largest edifice that New York contains. Its area is about three-fourths of an acre, and the shape of the building is irregular, with irregular sides, having been planned of a corresponding figure to that of the ground on which it is situated. The height of the building, from the sidewalk, is over seventy feet, and it is divided into six stories, the different departments of work being so arranged that the process of manufacture commences in the upper part of the building, and the books descend by a progressive movement from one department to another, as they approach completion, until received, as completed work, in the Depository on the first floor. The following are the dimensions of the building on its several side —198 feet 8 inches on Fourth avenue, 202 feet on Eighth street, 96 feet 11 inches on Third avenue, and 232 feet 6 inches on Ninth street—making a total front of over 700 feet. The depth of the building is 50 feet. The ground floor will be occupied as stores, and the part not required by the Society for their own operations will be let out as offices, several religious societies and the Society Library having taken the vacant parts of the building.

In a niche over the principal entrance, in the Fourth Avenue, stands a large-sized draped female figure, carved in brown stone, representing Religion. The rest of the building is plain, without much decoration, and cannot boast of any architectural beauties, more attention having been paid to internal comfort than outside decoration. In the centre there is an open area, forming a large yard, where the steam boiler will be placed, as the most commodious position, and which will prevent any danger from fire. Ample provision against accidents of this kind has, however, been made in the general structure and arrangement of the entire building.

Massachusetts Coal.

Prof. Hitchcock's late Geological Report on the Coal fields of Bristol, Mass., states some interesting facts. It has long been known, he says, that coal exists in Rhode Island, and the southern part of Massachusetts. Geologists have been slow to settle its exact position in the geological scale. It is a genuine coal field of the carboniferous series, however, and is of the same age as the great coal deposits in Pennsylvania, Virginia, and Ohio. The only difference seems to be that the Massachusetts coal field has undergone a change, occasioned by the action of the fire. The strata seem to have been subjected to lateral pressure, which has thrown them into undulations. The coal field covers an area of some five hundred square miles, and has been wrought in fifteen or twenty different localities, but generally without a remunerating profit. In the instance of the Mansfield Coal and Mining Company, a shaft of ten feet in diameter has been sunk to the depth of 171 feet, at the bottom of which they have driven a tunnel laterally to the distance of over 700 feet, with branches and other tunnels of an equal distance. In sinking the shaft and driving the tunnel, they passed through sixteen or seventeen layers, of coal, varying from one to seven feet in thickness. From one of the tunnels 2,500 tons of anthracite coal of a fair quality have been extracted, although the Company have sunk in the operations $100,000. There are three modes of ascertaining the existence of coal in a series of strata. One of these only has been employed in Massachusetts, viz.: that of sinking a shaft and then carrying tunnels across the strata. The second method is to cut a trench through the loose deposits over the rocks, and the third is by boring. The people in Massachusetts know but little about the expenses which some of the proprietors of the coal mines in England have incurred in sinking shafts to the depth of 100 fathoms (600 feet), and there is one which, if we recollect aright, is 1200 feet deep.

Trade and Commerce of St. Louis.

We have received a pamphlet carefully prepared in the "Missouri Republican" office, which presents an annual review of the trade and commerce of that city for 1852. There was a falling off in the grain trade of 100,000 bushels of wheat, which was attributed to a low state of water in some of the rivers, but a new era has opened on the commercial enterprize of that city, which is an evidence that in many instances a city placed at a distance from water communication may be as prosperous, commercially speaking, for internal trade, as one placed advantageously on a river or sea. We refer to the influence of railroads. This pamphlet states that the opening of the Alton and Springfield railroad during the past summer produced an immediate and satisfactory effect in every department of Industry in St. Louis. Although St. Louis is placed advantageously on a noble river, and has grown into greatness without the aid of a single line of railroad or mile of canal it is stated in this review that the good effect of the opening of the railroad mentioned has impressed the citizens of that place of the necessity for an extensive system of railway communications, and preparations have already been made for the construction of important works. St. Louis, from its superior position with respect to navigation, and sitting in the lap of the fertile valley of the Mississippi, is yet destined to be a second London.

Potato Rot.

As the period for planting potatoes is now at hand, we request the attention of our agricultural readers, who have our last volume, to the remarks of J. R. Chapman, Esq., on page 259, wherein he shows how the disease may be obviated. Since what has been termed "the potato disease" has broken out, in 1845, we believe, the best quality of potatoes have almost disappeared from our tables, and the price has arisen to more than double of what it was ten years ago. Although the disease has not been so virulent, as it was in 1846–7, still it is bad enough; the very soundest potatoes grown, spot during winter, and those which are considered to be "the best quality," can scarcely be preserved. We hope that much attention will be devoted this year, to the rearing of good potatoes; they are an essential vegetable to the mass of our city population, who find themselves, deprived of a great blessing when the price of them is so high. The following is said to be an excellent mixture for the protection of the potato vine:—"Take one peck of fine salt and mix it thoroughly with half a bushel of Nova Scotia plaster or gypsum (ground plaster is the best), and immediately after hoeing the potatoes the second time, or just as the young potato begins to set, sprinkle on the main vines, next to the ground, a table spoonful of the above mixture to each hill, and be sure to get it on the main vines."

The Steam Fire Engine.

Another trial of the steam fire engine took place at Cincinnati a few days ago. Steam was raised in four minutes from the time of lighting the fire, and in twelve minutes it was throwing a stream of water through an inch and three-quarter nozzle, from 50 feet of hose, a distance of 238 feet. Six streams of water were thrown at one time, each of them better than firemen generally put upon a fire. The "Enquirer" says that the engine will throw water in sufficient quantities to do efficient service at a fire, no one who has seen her work doubts for a moment. The great difficulty appears in the getting of her to fires. Being so cumbersome and heavy it is almost impossible to get her through the streets without cutting them up and dostroying the bowldering. If one could be built lighter it would no doubt answer the purpose.

The "Invention," a foreign scientific and mechanical journal, published in Paris, has the following paragraph, in the number for March, respecting Ericsson's Caloric Engine:—"The Scientific American, whose competency no one in the United States would dare to dispute upon such subjects, continues to exhibit much reserve respecting Ericsson's engine, which is now being subjected to experiment." [That reserve, the "Invention," will see, is completely removed.

Miscellaneous Items.

The "Panama Star" says that the largest pearl in the world is in the possession of Victor Plise, Esq., of Panama. The pearl is much the shape of an egg, without a single flaw in its entire formation; in color it is what judges consider perfection, and it weighs one hundred and fifty-six grains. It is valued at five thousand dollars, and if a match could be procured for it, the pair would be considered almost invaluable. Mr. Plise has a large assortment of beautiful pearls, all of which he has collected at his fisheries on the Pearl Islands.

The plate in the cabin of the steamer Victoria, wrecked near Howth, on the coast of Ireland, has been recovered by a diver; but the man protests that nothing in the world would induce him to go down a second time, as the scene in the cabin was the most horrible he ever witnessed. He thought he had entered a wax-work exhibition, the corpses never having moved from their positions since the vessel went down. There were some eighteen or twenty persons in the cabin, one and all of whom seemed to be holding conversation with each other, and the general appearance of the whole scene was so life-like that he was almost inclined to believe some were yet living.

Mr. Walter, the architect, it is said, has been authorized by President Pierce to repair, embellish, and procure furniture for the White House under the late appropriation.

Louis Napoleon recently bought for the Empress a piano, exhibited at the London Exhibition, for forty thousand francs.

A firm in Cincinnati has contracted to build one hundred and fifty wagons for a company of English Mormons, who are now on their way from Great Britain to the Salt Lake.—They will land at New Orleans, ascend the Mississippi, and cross the plains to their destination.

It is said that the English Ivy can be successfully cultivated with us. Washington Irving has a vine brought from Melrose Abbey, Scotland, which covers his house, at Sunny Side. Mr. Breckenridge, the successor of the late A. J. Downing, in the employment of the Government, on the Capitol Grounds, informs a correspondent of the "Waterbury American," that it can be cultivated with success in Connecticut. The ivy is found to preserve the building it grows on.

Bermnda papers say there have been imported into that island 16,000 bushels of potatoes from this country, for seeding the present crop, which bids fair to be twice as large as any hitherto.

Seven hundred hands are at work, raising and widening the levee at Cairo, at the junction of the Ohio and Mississippi rivers, for the protection of the city against inundation. These levees will be raised twelve feet above the point reached by the flood in 1844, and eighty feet wide on the tops.

Some enterprising manufacturers of New Jersey and New York have purchased a large estate in New Jersey, opposite Bedlow's Island, having a water front of about a mile. The intention is to lay out and build up a new city for manufacturing purposes. Already two large manufacturing establishments are projected.

In Paris, in 1852, the oyster eaters consumed 1,678,926 francs' worth of those animals, the average price was 2½ francs the hundred, and the total number devoured was 70,000,000.

The Peninsular and Oriental Company have only about a year's stock of coals in the India and China seas. There is the greatest difficulty in keeping up a stock of coals at these stations, in consequence of the colliers getting no return freights. Sailing ships in India and China are being rapidly superseded by steamers in everything but the conveyance of coal.

New Rolling Mill.

A new rolling mill has been erected by Messrs. Bailey & Patterson, at Harrisburgh, Pa., the engine for driving the works is from the establishment of Messrs. Neall, Matthews & Moore, Philadelphia, it is of 90 horse power, boilers, two in number, 30 feet long and 4½ feet in diameter.

The Crystal Palace.

It is not improbable that, after all, this great undertaking will prove a stupendous failure. Certainly, unless some new leaf is turned over in the association's books of management, the main objects for which it was projected will be defeated. Quite an attempt was made, not long since, to create an impression that applications for space in the building exceeded the limits of supply. So far is this from the truth that those to whom space has already been assigned are sending in notices of withdrawal of their applications. This is due to the insane policy of the managers determining to charge an entrance fee to exhibitors. Exhibitors when they know and understand this, very naturally, protest against being so fleeced.

The completion of the building before the first of May is an impossibility (as things now go.) and whether it will be done before the Fourth of July is a matter of serious doubt. The engineers and architects are at loggerheads; much of the material has to be fitted after it reaches the ground, beams being found too long, and girders too short; and, to use a homely expression, "the very old Harry is to pay all round." Theodore Sedgwick, Esq., the President of the Association, is a most excellent man, and does the best he possibly can, but he does not possess the tact and management indispensable for carrying out the erection of a building like this.

What the Association most need, is a thoroughly practical and experienced managing head—such a man as Barnum, for instance—who can pull, push, coax, or drive, as occasion requires; and who is accustomed to the control and direction of numbers of workmen. Such a man of leisure would not be caught with his work half done at the time when, as he had told all the world, it should be finished; and least of all, would he allow the saving or expenditure of $20,000 or $30,000 to drive the opening of an exhibition into midsummer, which might reasonably be expected to yield an extra $100,000 if opened on the day and hour it had promised.—[New York Sun, April 2nd.

[The above statements are correct, and the comments sound and sensible, as those of the Sun, respecting such matters always are.

Railroads in the United States.

On the first of January, 1853, there were in the United States, 13,227 miles of completed railroad, 12,928 miles of railroad in various stages of progress, and about 7000 miles in the hands of the engineers, which will be built within the next three or four years—making a total of 33,155 miles of railroad, which will soon traverse the country, and which, at an average cost of $30,000 (a well ascertained average) for each mile of road, including equipments, etc., will have consumed a capital amounting to $994,650,000.

13,227 miles completed	$306,810,000
12,928 miles in progress,	387,840,000
7,000 miles under survey,	210,000,000
33,155 Total - -	$994,650,000

Or, in round numbers, one billion of dollars. In all human probability, by the end of the next five years the United States will have more miles of railway than all the rest of the world. There are now in operation in the United States about 24,000 miles of telegraphic wires, or more than double the amount in other parts of the world.

Lead Mining in Missouri.

Notwithstanding the rise in the price of lead, the tables made up, show a deficit in the amount procured in the above State during the past year compared with those preceding. The following are deduced as the causes: 1st. The number of the mining population which the California emigration has carried off, amounting to at least one half. 2d, The failures in sinking for ores below the water level of the small beds of rock. 3d, The mining population being citizens of foreign birth, who take no interest in mining except for wages. 4th, Want of sufficient economical machinery to drain the wet grounds. 5th, Want of a sufficient capital, and a more general knowledge of the geology of the lead basins.

A lump of gold weighing 247 ounces, was picked up at Yankee Hill, in the vicinity of Sonora, valued at about $4,250.

© 1853 SCIENTIFIC AMERICAN, INC

Electric Globes of Fire in a Saw Mill.

MESSRS. EDITORS—Some months since a remarkable phenomenon occurred at a saw-mill worked by me. The small pit in which the crank worked was filled with water on a rainy day through the carelessness of the engineer. The saw was in operation, and at every revolution of the crank-shaft the crank plunged into the pit thus filled. While standing outside the mill house I saw a brilliant light within, and concluding the mill was on fire I called out to the engineer to extinguish the flames, who ran into the mill, directly towards the crank and pitman, when he noticed brilliant balls of fire, apparently about two inches in diameter, rolling off from the crank and pool of water in which it was working. The steam was cut off, the machinery stopped, and these globes of fire ceased to flow. I was informed by the engineer, an intelligent colored man, that the like had occurred before at a saw mill in charge of a Mr. Parker. The crank at this mill frequently become heated from friction, and to prevent this Mr. P. has made a box, water-tight, put it into the pit under the crank, and filled it with water. At every revolution of the shaft, the crank plunged into this box so fitted. The mill had not worked an hour before brilliant globes of fire were generated by the crank thus working in the water. This arrangement did not succeed to keep the rest of the crank cool. It is a philosophical question how these balls of fire are generated. It is well known that water is an extinguisher of heat—here it seems to have become fuel for the heat created by the pitman and crank, and instead of extinguishing that heat, became fuel for it, and generated these brilliant balls.

It is well known, also, that the compounds of water are oxygen, and hydrogen; were they separated, the oxygen uniting with the iron crank and forming the oxyde of iron, and the hydrogen, an inflammable substance, ignited by the heat of the crank, and generating these brilliant balls? Was this the Paine light? C. B. GREEN.

Jackson, Miss., 1853.

[The light was no doubt electric; streams of electric light have been generated in some factories by the friction of belts.

(For the Scientific American.)

Turbine Water Wheel---Parker's Claims.

MESSRS. EDITORS.—In the 25th number of the present volume you correct an error of one figure in Vol. 6, page 272, Sci. Am., I entirely agree with Mr. Sloan, that "the articles on water wheels in Vol. 6 are valuable, and that any error however small, should be carefully corrected." I would direct your attention to some other slight errors in those articles.

In the preceding number, page 264, Vol. 6, the following extract of the specification of a patent issued the 10th of July, 1847, to the undersigned, appears, viz.:—"I make the area of the cross section of the shute (or of all the shutes) by which the water is let on the wheel, equal to that of all the issues at which it leaves it. To produce a maximum effect the shutes and issues of the wheel, should be of equal size, and they move with the same velocity as the water." There is an error in the last sentence—"and they," should read, "and the wheel."

There are some errors on page 408, of the same volume. In the second paragraph—article "Hydraulics"—the word "volition," should have been "rotation," and the third paragraph—a description of figure 67—is misplaced. It should have been inserted after the first sentence of the fifth paragraph, after the words, "in diagram, figure 67." As it is, it is thrown in between the announcement of a principle and its illustration.

As you advocate the claims of persons who first publish to the world a discovery, I hope you will indulge me in a few remarks on the above principle of having the area of a cross section of the inlet, equal to that of the issues of the wheel.

This principle of action of water on a turbine [by the term "turbine," from the Latin, "turben," a whirling, a whirlwind, a vortex, I presume, I understand, wheels that receive the water with a whirling motion,] water wheel, I claim to have discovered by the investigation of the principles of hydrodynamics, and not by experiments, experiments, however, have since verified the result. This principle I published to the world, in 1847, by having it recorded in the Patent Office, and then again in 1851, in the Scientific American.

But why at this late date should it be attempted to fix the discovery on Mr. Parker? Mr. Parker claims the discovery of giving the inlet water a whirling motion, and so far as my information extends, he is entitled to it, in this country at least. But in France, perhaps, he was preceded by Fourneyron, who commenced the investigation in 1823. But that he discovered or practiced prior to 1847, the principle of making the inlet and outlet of equal sectional area I deny. In a description of Parker's wheel in the Journal of the Franklin Institute, nothing of the kind is mentioned, but, on the contrary, the inlet is said to be variable, and no mention made of the reduction of the co-efficient of effect thereby. In the article referred to (page 272, Vol. 6, Scientific American,) it is stated that the inlet was 10½ inches, and the issues of the wheel 9 inches; but by making the correction it leaves the issues 6 inches, or something more than one half that of the inlet, which agress with the practice of his agents at the South. And I have not seen any publication that intimated that they should be of equal size, until the one in question of the 5th of March, 1853. J. B. CONGER.

Jackson, Tenn.

Price of Diamonds.

Rough diamonds, fit for cutting, are sold at £1 13s. 4d., to £2 the carat. A carat is rather more than three grains, and 156 carats equal to one ounce Troy. But if the stones are above one carat, the square of the weight is multiplied by the price of a single carat; so that, for example, a rough stone of three carats costs 3x3x £2 or £18. It is similar with cut diamonds, and in 1850 the purest briliants of one carat brought more than £8, a brilliant of two carats 2x2x £8, or £33. When stones are over eight or ten carats, however, this is altered, so that they are valued still more highly. Diamonds of a quarter of an ounce weight are extraordinarily costly, but still larger are met with; and one of the largest known is that of the rajah of Mattun, in Borneo, which weighs nearly two ounces and a half; that of the Sultan of Turkey weighs two ounces; one in the Russian sceptre more than an ounce and a quarter.—The greatest diameter of the last is one inch, the thickness ten lines. The Empress Catherine II. purchased it in the year 1772, from Amsterdam, and for it was paid £75,000, and an annuity of £650. Diamonds weighing an ounce exist also in the French and Austrian regalia. One of the most perfect is the French, known as the Pitt or Regent diamond. It was bought for Louis XV., from an Englishman named Pitt, for the sum of £135,000 sterling, but has been valued at half a million. One of the stones most renowned in the East, is the Koh-i-noor, or Mountain of Light, now in possession of the Queen of England. It came from Golconda to Persia, and while uncut weighed more than five ounces, but now, polished, only about two ounces. It is valued at more than £2,000,000 sterling. If we look only to the common mode of estimating the value, a perfect brilliant weighing half a pound, would be worth £20,000,000. Some have stated that such a diamond exists among the royal treasures of Portugal as large as a hen's egg; according to others this is only a topaz.

An Erect Position.

A writer on health very justly condemns the habit of lounging, in which a large number of persons indulge, as injurious to health. He says:—"An erect bodily attitude is of vastly more importance to health than is easily imagined. Crooked bodily positions, maintained for any length of time, are always injurious, whether in the sitting, standing, or lying posture, whether sleeping or walking. To sit with the body leaning forward on the stomach, or to one side, with the heels elevated to a level with the head, is not only in bad taste, but exceedingly detrimental to health. It cramps the stomach, presses the vital organs, interrupts the free motion of the chest, and enfeebles the functions of the abdominal and thoracic organs, and in fact, unbalances the whole muscular system. Many children become hunchbacked, or severely round-shouldered, by sleeping with the head raised on a high pillow. When a person finds it easier to sit or stand, or walk or sleep in a crooked position than a straight one, such a person may be sure his muscular system is badly deranged, and the more careful he is to preserve a straight, or upright position, and get back to nature again, the better."

Improvements in Dyeing.

The following processes for obtaining a new description of blue, and extracts of madder have been lately introduced into notice in France, and are now translated for the first time into English from "L'Invention," a foreign publication to which we are often indebted for much useful information on the arts and manufactures abroad.

A NEW BLUE—If in an alkaline molybdate there is precipitated after the addition of a phosphate all the molybdic acid that it contains there will be obtained in the form of a fine powder a bright citron yellow color which is wonderfully increased by adding a few drops of nitric acid. Caustic alkalies and carbonates of the same dissolve this powder after it has been washed and dried, and furnish a transparent solution from which it is precipitated by acids without any change of color. For example by dipping a piece of cloth in soda, and transferring it to a concentrated acid solution the yellow coloring matter is precipitated on the surface in very great purity.

This powder exhibits very great sensitiveness in presence of the reducing metals, for example by rubbing a small quantity of this powder with a cork and adding a few streaks of chlorohydric acid on a piece of tin, there are obtained in succession every imaginable hue, from yellow to the deepest blue. This property is turned to account by dipping the fabric, when taken out of the acidulated bath, into a solution of the chloride of tin, by which it is colored to a deeper or lighter blue, according to the quantity of tin contained in the solution. This product offers, in printing calicoes and other fabrics, an advantage that had hitherto been with difficulty realized, and whose results still left much to be desired, namely, that of being able to produce on goods, blues of an extreme purity on a yellow ground, or the contrary.

MADDER—A new method of making an extract of the above dye has been lately patented in France. Madder in powder, or the flower of the same, is steeped in a neutral organic oxyde, such as the hydrate of methylene, acetone, &c., whether these oxydes are alone or mixed with alcohol or other ethereal matters. The madder may be used either wet or dry, according to the degree of richness that it is required to give the extract that is being manufactured. After having been steeped for a certain length of time, the ligneous substances remaining in the solution are submitted to pressure so as to extract entirely all the coloring matter that they contain. The coloring matter is then precipitated by adding water to the solution and afterwards separated by means of a filter. It is then dried, and can be warehoused or sent away immediately. It is to be observed that by this process neither the madder nor the solutions made use of are submitted to the action of heat, by this means we avoid the noticeable changes that the last-named agent exercises over coloring mater. If a quicker precipitation of the extract of madder is required instead of employing water alone for this purpose, it can be used acidulated with sulphuric acid, but in this case the precipitate must be carefully washed until it presents no further acid re-action. Unless this precaution is taken the employment of the extract of madder thus obtained would be detrimental on account of the re-action of the acid that would ensue. Another way of obtaining a new dye from madder, which has received the name of "Rubiacine" has been likewise lately patented in the same country. The madder is placed whole or pounded into an alkaline solution in which it is left to steep for two or three days. At the expiration of this period the solution is neutralized by means of acidulated water, any alkali and acid may be used for this operation. It is then poured altogether in a filter and slightly pressed, after which it is evaporated, and the so-called "Rubiacine" is obtained solid, it is then pounded and put up in casks. This material possesses dyeing properties equal to four times that of madder powder, and equal weight for weight to the extract of the same, it is particularly noticeable for the property that it possesses of dyeing cotton a Turkey red.

Extravagant Profits of Lead Mining.

The "Grant County Herald" remarks as follows, under this head: "We learn that smelters at Franklin, Iowa Co., are paying $40 per 1000 lbs., for mineral. We fear that this rate is the result of competition, or else over estimated demand. That mineral will fluctuate the coming season between $30 and $40, we have no doubt but that its steady value, based upon the eastern and St. Louis price of lead, will be $40, we donbt very much. Be that as it may, miners may rely upon a very high compensation for their labors henceforth." We fully agree in the above opinion. The price of our staple, for some time to come, must mainly depend on the prices asked by the owners of Spanish and English lead, for it is plain that our own mines cannot supply the market. If foreign dealers choose to keep the price to near its present limit, we think they can do so, but this cannot be a safe reliance in the transaction of a heavy business.—[Galena Advertiser.

Curious Geological Formations.

In making some excavations on the Pacific Railroad, near St. Louis, the workmen came upon some flint nodules of a curious shape.—They are rounded much like a melon, and may easily be supposed to be a petrification of that fruit. A specimen having been broken with a tolerably smooth cleavage, disclosed a series of what appeared to be rings, and in the centre the appearances of some ore looking like silver ore. From one of them in its natural state a portion of what might be mistaken for an outer coat had been removed, much as if the stone had once been a melon and been petrified after a part of its rind had been peeled away. The surfaces of these nodules exhibited numerous perfect impressions made by the leaves of plants, so distinctly and so delicately traced as to produce a very beautiful effect. The specimens were found in a ledge of limestone, which abounds in stones of a similar kind.

Meteorology.

Our foreign exchanges make mention of a curious phenomen that lately presented itself in the Gironde, France, being nothing less than the descent of an aerolite weighing over 90 lbs., by which a horse was killed from the injuries received. It appears that the phenomenon was seen by a child that was tending the animal, and who was some yards off at the time of the occurrence; a sudden noise like thunder at a distance, caused him to look up, and he perceived a black mass, the sight of which terrified him so much that he could not take to flight, cleaving the air and falling in the direction towards him. Fortunately he escaped, and the mass fell upon the horse's back, which was knocked down by the blow. The aerolite has been examined by different persons, who, from a close examination, judge it to contain a large quantity of iron mixed with other earthy and metallic substances.

The New Orleans papers speak highly of specimens of hemp made from the fibres of the okra, or "gumbo" plant. They state that the merit of this hemp consists in the cheapness of its culture, the abundance of the raw material, the quickness with which it grows, giving, they understand, three crops a year, its superior yield to the acre, of five times as much as the Kentucky hemp, its more durable qualities in water or damp than any other hemp, and its easy manufacture into bagging. It is stated that the article can be produced at the North as well as the South, though not so profusely, and that it will supersede all other sorts of hemp in the manufacture of bagging.

© 1853 SCIENTIFIC AMERICAN, INC

NEW INVENTIONS.

Improved Steam Gun.

Measures to secure a patent for the above have been taken by F. Wellhouse of Copley, Ohio. This invention relates to an improvement in Steam Guns and consists in the combination of a sliding tube and piston so constructed and arranged that the piston drives or forces the shot or ball from the larger into the smaller bore of the gun, and is afterwards drawn back. A sliding tube is then moved forward and forms a communication between the steam pipe and larger bore by which the steam is admitted, and the shot or ball discharged from the gun. This sliding tube is connected with another tube, so that when drawn back it cuts off the steam and thus allows the piston to be moved forward. The ball or shot is fed into the gun from a hopper, and the sliding tube having been drawn back, it passes into a chamber in the back part of the gun, and from thence into the larger part of the bore, which is directly underneath. The piston is then moved forward and forces the ball from the larger into the smaller part of the bore, the space between them being of a conical shape corresponding to the head of the piston. The piston is then drawn back, and the sliding tube moved forward, when the steam is admitted by an opening that communicates with the other tube, and rushing through the gun, expels the ball in its passage.

Improved Straw Cutter.

Measures to secure a patent for the above have been taken by Hiram Haight, of Nassau, N. Y. The improvements consist in the employment of an adjustable feed gearing, by which the quantity of straw for the cutter can be supplied with greater or less speed, as required, and using, in connection therewith, an elastic pressure bar for holding firmly the stalks of straw at the edge of the feeding trough when about to be cut. The adaptation for feeding consists of two corrugated rollers placed one above the other, passing transversely through the feeding trough and furnished with pinions that gear into each other. The pinion of the upper roller is moved by a pawl and spring, which are actuated by a rod connected to the treadle of the machine the lower roller of course revolving in an opposite direction to the upper. Another pawl prevents any backward motion of the pinion. The velocity of the rollers and consequent rapidity of the feed are regulated by an adjustable pin, which, projecting from the rod, receives the up stroke of the treadle. The pressure bar is connected with the treadle by means of a rod, and the force exerted by it in keeping the straw in its position before the cutter is modified by a spiral spring underneath.

Percussion Cap Primer.

A neat portable apparatus, that can be carried in the pocket, for placing caps on gun nipples, has been invented by Russel Frisbee, of Middletown, Conn., who has taken measures to secure a patent. It consists of an oblong metal case, containing a grooved recess in which the caps are placed, and having at the end, two springs so arranged as to prevent the caps from escaping from the case unless when required. On each spring, at the outer end is a concave-shaped lip, which works through a small opening in the case, and is operated by the thumb, this is done by pressing against a button which forces down the springs, and permits the insertion of the cap on the nipple of the gun. The grooved recess or chamber already mentioned is supplied with caps between the upper and lower lip, and they are prevented from escaping into the other part of the case by a stop on the upper part of the chamber.

Cards for Hooks and Eyes.

The common way of attaching hooks and eyes to cards, is by laying them upon a flat sheet of card board and sticking each hook and eye separately on it; this method requires the needle and thread to be passed several times through the card board for each. An improvement on the above has been invented by Thaddeus Fowler, of Northfield, Ct., who has taken measures to secure a patent. By this new method the card board is perforated at regular distances apart, and bent in parallel rows, forming ridges, so that when the hooks and eyes are laid upon its surface in the proper order, they are looped securely to the card by one thread, which is long enough to pass through the entire ridge.

Mill Stone Pick.

An improved description of Pick, in which the blade is removable from the handle, has been invented by Anson L. McIntyre, of Norwalk, Ohio, who has taken measures to secure a patent. The blade is grasped by a taper clamp, which is made to press tightly on it by a socket likewise taper, which latter fits in a loop at the end of the handle. Both ends of the clamp are taper, and it has a longitudinal groove to receive the blade, and is tightened as before described, the thickest part being at the points. The blade is of equal thickness throughout, and the advantage proposed by this improvement is the facility of sharpening the pick when blunted, grinding only being required, whereas, when the ordinary picks become much worn, they require to be repaired, and lengthened or drawn out. As the blade wears by use it is not placed so far in the clamp, but is tightened by means of wedges placed in the slot at the back of the blade.

SHANK'S IMPROVED LATH MACHINE.

Figure 1.

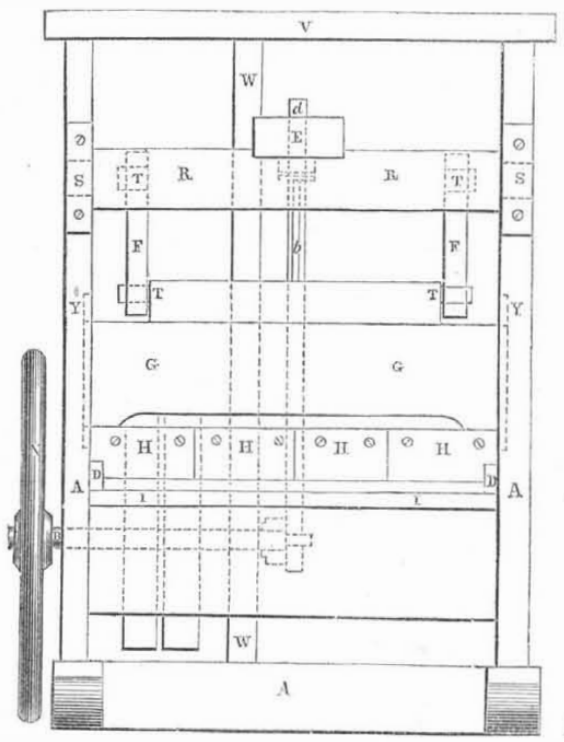
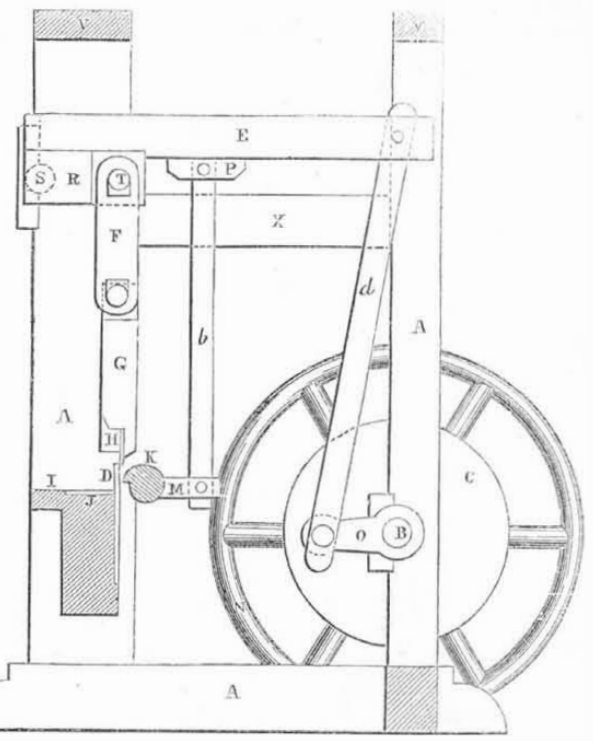


Figure 2.

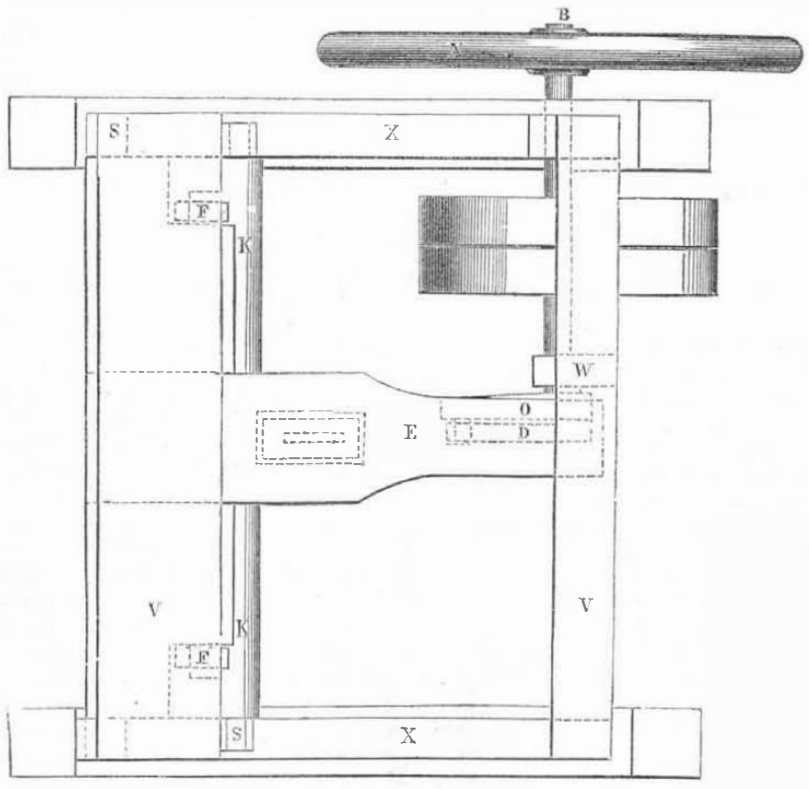


The accompanying engravings are views of an improved lath machine, invented by Isaac R. Shank, of Buffalo, Putnam Co., Va., who has taken measures to secure a patent. Figure 1 is a front view of the machine; figure 2 is a transverse sectional elevation, and figure 3 is a top view. The same letters refer to like parts.

A A is the general framing; V V, and X X, and W, are the connecting pieces of the frame; B is a shaft provided with pulleys, C—one a driving and the other a loose pulley;—O is a crank; N a fly wheel; *d* is a connecting bar, attached to beam, E, which is connected at S, to the broad bar, R R, which receives a vibratory motion and works the cutter stock, G, to which the cutters, H H, are attached by means of screws. The beam or stock, G, slides in grooves, Y Y; F F are links attached to G G and R R, at T T, thus uniting the knife stock to the beam which gives it motion.

The knives are divided into four pieces, and they are therefore much easier tempered, and should one become dull or break it can be repaired at but a small expense; I is the table on which the lumber is placed to be worked; J is an iron plate screwed down on the back part of the table to serve as the under knife; D D are guide pieces in front of the knife to prevent it from coming on the table; K is the gauge for gauging the thickness of the bolt, which has a vibratory motion through the arm M, on the gauge, and the connecting bar, *b*, and block, P, which is attached to beam, E. When the lumber is pushed forward on the table, it goes below the notch in the gauge, K, and when cut off the said gauge swings and carries the cut lath down, and thus frees it from the knives, and at the same time the gauge is thereby also employed in its vibration for gauging the next lath. The lumber is fed in by hand. There is but little metal in this machine, so that it is very cheap of construction. Figure 2 exhibits the operation of the machine with sufficient clearness to enable any person to comprehend the mode of its operation.

Figure 3.



More information may be obtained by letter addressed to the inventor.

Improvement in Joining Stones.

An improved method of uniting or locking stones together in building light-houses, and for other like purposes, by which the necessity of using mortar is entirely superseded, has been invented by John P. Avery, of Stonington, Ct., who has taken measures to secure a patent. The method consists in dovetailing together the sides of the stones used for the foundation, and joining them again in a similar manner with others, so that it is impossible to separate them without first breaking the stones in pieces. In order to unite them more firmly, a bolt or key is employed for pressing the dovetails firmly in their corresponding slots, or pieces of stone or other material may be employed for this purpose, and the crevices filled up with mortar.

Improved Let-off Motion.

Stephen A. Greene and Israel Greene, of Westerly, R. I., have taken measures to secure a patent for the above. In order to preserve a uniform "let off," it is necessary that the movement of the yarn beam upon its axis increase in the same ratio with the decrease of its operative diameter, caused by the decrease in the quantity of yarn. For this purpose the above invention consists in communicating the necessary intermittent motion to the yarn beam by a train of mechanism which is actuated by a constantly revolving cam or eccentric, operating on a lever whose position is so controlled by a shoe or bearing piece, which always presses against the yarn on the beam, that when the latter is full the action of the cam on the lever is such as to move it slightly, but that as the quantity decreases, the action of the cam gives a proper increase to the motion of the lever, and consequently to the motion imparted by it to the beam.

Modellers Clay.

Sculptors and modellers are frequently exposed to inconvenience if obliged to leave their work for a time, by the rapid dessication of the clay which they employ. This evil may be obviated by moistening the clay with the concentrated solution of glycerine.

Mr. Howland, the American merchant, who died recently in Italy, has left $20,000 to the charitable institutions of New York city.

© 1853 SCIENTIFIC AMERICAN, INC

Scientific American

NEW-YORK, APRIL 9, 1853.

Repairs to the Ericsson---Let the Truth be Told.

The Ericsson is getting new *cast*-iron crown plates, in place of wrought iron ones in her furnaces.

The "New York Daily Times," of Saturday the 26th, had a long article on the subject, and made one statement which contradicts another made by Capt. Ericsson, in our presence.

It says, "the bottoms of the cylinders are of *wrought iron* and *convex* in form, because no foundry would cast them. During the *first* trial trip down the bay, under anything like a *full* pressure, the wrought iron bottoms (it should have said crown plates) proved too elastic. When the pressure reached nine pounds, one or two of the bottoms yielded from half to three quarters of an inch. Upon the next trip, the pressure was less, and during the voyage south, it never exceeded eight pounds. The remedy for this is simply to substitute *cast-iron* for the wrought-iron bottoms used hitherto; Messrs. Hogg & Delameter are now casting them."

In answer to the foregoing we say, it will be remembered by those who were on board the Ericsson on her second trial trip, that Alex. Jones, Esq., of this city, asked Capt. Ericsson if the crown plates of his furnaces were not liable to *give way*, and the answer he received was "NO." "Their form," (convex) said Capt. Ericsson, "allows them to expand and contract without danger." Said Mr. Jones, "the talk on 'Change among those who have a knowledge of such things is, *they cannot* stand." The "Times" says, in the article referred to. "Practical engineers who make any pretensions to a mastery of their profession are very careful even while dealing largely in annonymous and injurious insinuations not to put themselves *on record* against the speedy and complete success of the caloric engine." This is untrue; we can get the opinions of fifty engineers, if we choose, to put on record against its success, while the world lasts. How does this accord also with the statement and question of Mr. Jones? it has already come to pass what engineers talked of on 'Change, and which Capt. Ericsson denied, and which we heard with our own ears.

The "Times" also says, "The theoretical demonstrations with which many of our so-called *scientific* journals lately abounded that the use of heat *over and over* again for the purposes of motive power was absolutely and simply impossible, have already vanished altogether."

No paper professedly devoted to science but the Scientific American has put forth theoretical demonstrations, to prove the principle of using heat claimed for the Ericsson, erroneous. The advocates of the Ericsson claim that a certain amount of heat by the use of packages of wire gauze can be made to produce an infinite amount of motion—strokes in an engine. We deny this, it is against all the established laws of mechanical philosophy, and there is not a single scientific engineer or professor of mathematics and engineering in our country but will, if called upon, corroborate our views; if we are not correct the Principia of Newton is trash, and the philosophy of mechanics as taught in our colleges for two centuries (but which the editor of the "Times" has never learned) and is now taught there, is false. If a definite quantity of heat can produce an infinite amount of motion, there is hope for the static pressure engine yet, although we exploded that humbug more than a year ago, the principle claimed is the same in both cases. In conclusion let us say that cast-iron crown plates for wrought-iron ones is a new idea in engineering, but as poor as the use of hot air. What engineer of common sense would use cast for wrought-iron in a high pressure boiler. We now say and call upon all to mark our words, that the cast-iron crown plates will soon be found as useless as the wrought-iron ones. So far as it regards anything the "Ericsson" has yet done, our readers will see that their confidence in our opinions has not been misplaced.

Fuel and Mechanical Power.

As the saving of the fuel is the only string on which the advocates of the hot air engine harp, we must say, they exhibit an amount of ignorance on the subject worthy of a native of the interior of Africa. The Arctic burns 84 tons of coal per day, and we assert that the Ericsson cannot go as fast and use 100 tons; When our north river steamboats increase their speed to but a few miles beyond their average rate per hour, they consume four and five times the usual amount of fuel. Dr. Lardner himself, who presents in his "Railway Economy" the Iron Witch, of Capt. Ericsson, which turned out a complete failure, as a favorable specimen of a north river steamboat, admits this to be true.

When the Oregon and Vanderbilt had their famous race on the 2d of June, 1847, the former consumed 18 tons of the very best picked coal in three hours, running at the rate of 24 miles per hour. She will run to Albany in 10 hours at the rate of 15 miles per hour, and use only 12 tons of common coal. Thus with an increase of only three-fifths the speed, she consumed more than 6 times the quantity of fuel—the increase was as 6 tons to 0·83 of a ton. With this data of the quantity of fuel necessary to run a steamboat according to a certain speed, the Oregon would only use 1⅓ tons of coal in running to Albany at the rate of 7½ miles per hour, that is allowing a double speed to require 8 times the amount of fuel which appears to be about the quantity.

Withdrawals from the Patent Office.

We request the attention of our readers to the following letter:—

U. S. PATENT OFFICE, WASHINGTON, March 20, 1853.

SIR—In reply to your's of the 1st inst., I have to inform you that, doubting the legality of refunding money on the withdrawal of an application, the fee on which consists in part of that paid on filing a caveat, I have submitted the question to the Attorney General, and until his decision shall have been communicated to the patent office, all such applications for withdrawals must be suspended.

Respectfully R. C. WEIGHTMAN, Acting Commissioner.

Since the re-organization of the Patent Office in 1836, every Commissioner of Patents has refunded the sum of twenty dollars according to the plain provisions of the law—on the withdrawal of every application for a patent. When Mr. Hodges was appointed he sent out a new order of instructions respecting such payments, and the above is the first case bearing on the subject which has come under our cognizance. Had he followed in the footsteps of his predecessors, abiding by the plain language of the law, the Attorney General would have been saved the trouble of deciding upon such a question, and other troubles in connection with it, would also have been avoided.

Section 12, of the Patent Act, of 1836, in relation to the fees of caveats says, "which sum of $20, in case the person filing such caveat shall afterwards *take out* a patent for the invention therein mentioned, shall be considered a part of the sum *herein* required for the same."

That specific sum mentioned as *herein required* refers to section 7, of the same act, which says, in reference to withdrawals:—"In *every such case*, if the applicant shall elect to withdraw his application, relinquishing his claim to the model, he shall be entitled to receive back *twenty dollars* part of the duty required by this act. On filing a notice of such election in the Patent Office, a copy of which certified by the Commissioner, shall be a *sufficient warrant* to the Treasurer for paying back to this said applicant the sum of *twenty dollars*." This is all so plain that the wayfaring man need not err in respect to its meaning; it can have no other than just paying back $20 upon every withdrawal of an application for a patent. To refuse to pay it back in the above case is a violation, we believe, of the plain letter of the law; the duty of the Commissioner was to certify at once, to a copy of the application for a withdrawal, so that the money returnable by law should be granted immediately to the applicant. To alter the established policy of the Patent Office after it has paid out thousands of dollars for the past seventeen years for such withdrawals, exhibits a want of consideration. Before the old policy can be abandoned, with a regard to justice, the patent laws must be altered. If it were the law to refund no moneys on rejected applications, *upon which Caveats had been filed*, we would not and could not utter a disapproving word, but instead of this being the case, there is not a syllable in the whole Patent Code authorizing the Patent Office to refuse the paying back of $20 on *every* withdrawal, when the application had been fully made.

It is true that, in the case of filing a caveat, and again applying the fees to an application for a patent, more labor is entailed upon the Patent Office than in a case where no caveat has been filed; but the Patent Office is not in debt; the fees pay all the expenses. If, however, it is considered necessary to charge more for a case like the above, let the law be altered to charge $25 for a caveat and allow $20 to form part of the patent fee. Or let $5 be the Patent Office fee for a caveat, and let $30, in every case, be paid on the application for a patent. Five dollars are sufficient to cover all the expenses of the Patent Office for filing a caveat. We should have no objections to such an alteration of our patent laws, but until they are so altered let the Patent Office honestly and rigidly adhere to the law as it is, and make no rules which do not harmonize with the code.

Events of the Week.

TIN AND COPPER PRICES—The metal trade of Birmingham, England, rules the world in respect to articles of tin, copper, and light jewelry. Since we last noticed the rise in the price of tin, another advance has taken place of no less than $10 per ton. The price of copper has also advanced to no less than $695 per ton; the small manufacturers of copper and brass articles, in Birmingham, have stopped manufacturing, owing to the high price of tin and copper.

INCRUSTATIONS IN BOILERS—Fredk. Dam, a chemist, of Brussels, Belgium, has lately taken out a patent for employing a solution of soda, in steam boilers, for the purpose of precipitating impurities in the water. Soda will precipitate lime, which will fall to the bottom. Some of the salts of soda are dissolved in hot water and then poured into the boiler. This substance is not expensive and can easily be tested. In our opinion it will be found to work very well.

IMPROVEMENT IN THE MANUFACTURE OF IRON—This is a subject of deep interest to our manufacturers, and a discovery has recently been made in England, which is of the utmost consequence to all engaged in that art who use coke for smelting. As we learn by our cotemporary, the "London Mechanic's Magazine," at a late meeting of the Institution of Civil Engineers, a paper was read by W. Fairbairn, C. E., on the increased strength of cast-iron produced by the use of improved coke. It was stated that the quality of cast-iron had greatly deteriorated by the application of the Hot Blast, by which a large per centage of slag and other impurities, viz., sulphur, phosphorus, &c., were reduced into cast and malleable iron, destroying its tenacity and making it *red* and *cold short*. Impure fuel is also a great cause of destroying the tenacity of cast-iron, especially when it contains sulphur. The improvement has been made in removing the sulphur from the coal. Iron that was melted with common coke contained 0·281 proportions of sulphur; some kind of iron, melted with purified coke, contained only 0·191 proportions of sulphur. A great increase of strength had been obtained in the improved iron. The coke was purified by adding a considerable quantity, in layers, of common salt, among the coals. This salt acts upon the sulphur in the coal, when subjected to heat in the coke-oven, forming the chloride of sulphur and disengaging it. A portion of the sulphuret of sodium was left, but this in the iron furnaces does not yield its sulphur, but passes off, during combustion, into the cinders.

Another plan for using the salt so as to remove sulphur in the coal while in the smelting furnace, is to add a considerable quantity of the salt (chloride of sodium) with the ore, so as to mix it with the coal and the iron.—This is a good plan for those iron works, which employ coal and not coke in smelting. We are not informed of the exact quantity of salt used, and in fact this could not be determined, as that must be according to the quality of the coal and ore. Our manufacturers can easily try the experiment with half a bushel of salt to the ton. In some experiments made with iron produced without the salt and with it, on bars one inch square; that made with improved coke was found to be from 10 to 20 per cent. stronger. The cast-iron made with improved coke was superior in the ratio of 5 to 4.

In England nothing but coke is used as fuel for locomotives; it will yet be employed extensively in our country, as we have bituminous coal fields of greater extent than all those known in the world beside; our anthracite fields are mere plots in comparison with our bituminous fields. Coke made with salt, by removing the sulphur, must be excellent for locomotives; and will tend to make the tubes endure twice as long. We commend this subject to all those engaged in making coke and manufacturing iron.

Aerial Navigation by Steam without Balloons.

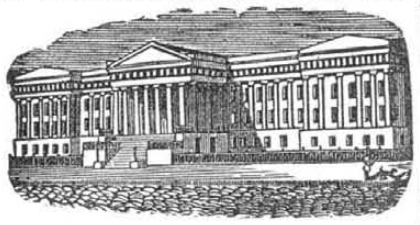
Theodore Poesche has presented a plan for navigating the atmosphere with a car propelled by a steam engine without employing a balloon. His plan is published in the last number of the Journal of the Franklin Institute, and he has sent us a pamphlet containing his plan, illustrated with some engravings. We certainly would like to see Mr. Poesche driving his steam car "through the ether blue," but his plan presents no rational ground for us to hope we shall ever see him perform such a feat. We consider that safe, economical and successful aerial navigation would be the grandest and most important invention perhaps ever made, but no plan yet proposed, no means yet tried, have by actual experiments (the only way to test the value of any invention), proved anything more than that, with a gas more rarified than air, man is enabled to ascend by the help of a huge balloon to some upper strata of air, there to be drifted by the current of wind to some distant place—not without risk and danger in a single case. M. Poesche's plan is to build a long, narrow, and light wooden vessel, with a flat bottom, and with wings of canvas, and propel it by a screw propeller driven by steam power. "My ship," he says, "most nearly resembles the flying fish, which progresses by the spiral action of the tail, while its extended fins support it in the air."

He trusts to the propeller to drive his long boat through the air, but he will find himself greatly mistaken. The screw was proposed long ago to drive aerial ships with balloons, but could not do it, and that it will be able to do so now without a balloon, is an impossibility, just as much so as that the author of the plan is able to fly by tying wings to his shoulders; in fact, the latter case is the most feasible. There is one way to prove we are wrong, and that is for M. Poesche to put his invention into practice, and floor all opposition by actual demonstration.

Pneumatic Telegraph.

In a few weeks we expect to be able to present engravings of a pneumatic telegraph, invented by J. S. Richardson, of Boston, which presents features of a new and important character. This kind of telegraph is composed of a tube, which, by exhausting the air from it by a steam engine working a huge air pump, is intended to send packages from one place to another through it with great velocity. The idea of sending packages in this manner from one place to another is not new, many attempts have been made to carry it out, some of which we have witnessed. Mechanical difficulties, however, have prevented the success of such a desirable mode of expressing parcels, and these it is believed have been overcome by Mr. Richardson. His atmospheric tube telegraph and railway is very ingenious, and in a tube one mile long, it has operated successfully for some time. We will present a more full description of the invention when we illustrate it. A joint stock company is about to be formed for a line of this telegraph, between this city and Boston.

© 1853 SCIENTIFIC AMERICAN, INC



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 29, 1853.

LUBRICATING OILS—By Luther Atwood, of Boston, Mass.: I claim the manufacture or combination of paranapthaline and fixed oils derived from coal tar, and boiling from 450 to 675 degrees, Fahr., as produced by the process, as described, the said new manufacture being highly useful as a lubricating composition, either alone or combined with oils or fatty matter, as set forth.

Also the combination of this product, so made with concrete, or thick fatty matter, or oils, for the purpose of liquifying them, or rendering them more mobile, or imparting to them lubricating qualities, as specified.

WINNOWERS OF GRAIN—By S. Briggs & J. G. Talbot, of Sloansville, N. Y.: We claim causing the upper sieve or riddle to vibrate at a greater speed than the screens, as set forth.

BREAKING HEMP—By Lewis W. Colver, of Louisville, Ky.: I claim the combination of the oscillating beaters, and the spring bars placed above and below the beaters, so that the recoil of the springs after the beater leaves the bars, shall shake out the hemp and clear it of its woody portions, as described.

HOT-AIR FURNACES—By Wm. Ennis, of New York City: I claim the employment of an inverted cone within a drum or cylinder, in whose side the taper end of said cone is inserted and allowed to communicate with the surrounding atmosphere for the purpose of creating an atmospheric reversing draft to cool the direct heated current from the fire; the said cylinder communicating with the fire chamber and ash pit, as described.

ELECTRIC TELEGRAPHS—By Moses G. Farmer, of Salem, Mass.: I claim the method, as described, of bringing any number of telegraphic signalizing and recording instruments into successive electric connection with the common communicating wire; meaning, more particularly, to claim the combination of the writing and working, or primary and secondary circuits, the electro-magnets and movable armatures of the primary circuit, the local magnets, and their movable armatures and pallets, or equivalents therefor, and local battery and battery connections of each terminus, and connections leading to the armatures of the local magnet, the escapement wheels and wheels U and Z on the arbor of each, the two series of springs of said wheels U and Z, and branch connections, and the branch connections of the main writing circuit at its two termini, the whole being connected and made to operate together, as described.

PENDULUM BALANCE—By Benj. Fenn, of Hartford, Ohio: I claim a machine for ascertaining, instantly, the weight of bodies by means of a scale, dish or plate, supported by pivots upon a heavy weighted semicircular frame, or its equivalent, in the manner of a pendulum, and operated by catches, as described.

SEED PLANTERS—By Isaac H. Garretson, of Clay, Iowa: I claim planting corn in check rows, by the planting sides, worked on the cross bar by hand, in the manner set forth.

KNITTING MACHINES—By John Maxwell, of Galesville, N. Y.: I claim the construction of the locking apparatus, by placing standards upon the back ends of the half-jacks, to carry springs, which regulate the pressure of the bar upon the jacks, in combination with an apparatus for raising said locking bar, the whole constructed and arranged for the purpose set forth.

PAGING BOUND BOOKS—By Thomas McAdams, of Boston, Mass. Ante-dated Sept 29, 1852: I claim the employment of a square, rotating shaft, as a bed for the odd numbers, and the shaft D, as a bed for the even numbers of the types, in combination with the tongue, as a platen to both sets of types, the same being operated by the treadle, ratchets, and pawls, so as to enable the operator to print the odd and even numbers of the alternate pages of a bound book, by a single movement of the treadle, as described.

SPIKE MACHINES—By James H. Swett, of Boston, Mass.: I claim skewing the shafts or axes of rotary-pointing dies, so that they shall stand oblique to each other, and bevelling off the faces of the dies to the same, or about the same angle at which the shafts stand to or cross each other, for the purpose of forming a close-fitting space in front of the dies, or where the blank is fed in, and spreading the dies in rear or behind, where the spike is pointed, so as to release it and allow the nippers to take the spike from the pointing dies, without injury to the spike, as described.

VERTICAL PIANOS—By George Traeyser, of Cincinnati, Ohio: I claim the construction, as described, of a vertical piano, having the tuning pins placed below the lower edge of the sounding board, for the objects explained.

SEWING MACHINES—By Thomas C. Thompson, of Ithaca, N. Y.: I claim, first, the magnetic shuttle and race, one or both, for the purpose of keeping the shuttle in perfect contact with the face of the shuttle race, without the use of springs, or any other device, and thereby ensuring the securing of every stitch, as described.

Also, the curved and hinged cap, in combination with the shuttle, to confine the cop in the shuttle, as set forth.

Also, the use of a cop, without a spindle or spooler, in combination with a shuttle, or its equivalent, when the thread is drawn from the inside of the cop, by which means I retain a uniform draught on the cop thread as it is drawn or paid out from the shuttle, as described.

WIRE FENCES—By Matthew Walker, Matthew Walker, Jr, & D. S Walker, of Philadelphia, Pa.: We claim the arrangement of the hooks within the mortises, so that the parts of the hook shall be sustained and kept from spreading by the mortise, and a strain upon the wires tend to steady the posts, as described.

RE-ISSUE.

SCREW BLANKS—By Thomas J. Sloan, of New York City. Patented Feb. 25, 1851: I claim the lifters, which select and lift the blanks, etc., from the hopper, substantially as specified, in combination with ways or conductors, or the equivalents thereof, as specified, into or on to which the blanks, etc., are transferred.

Also, giving to the lifters or to the inclined ways, or their equivalents, a lateral motion, in combination with a stop or detector, as specified, for the purpose of arresting the operation of the lifters until a further supply is required.

Also, the sliding carrier, with its recess, for receiving and holding the screw blanks, as specified, in combination with the spring fingers, for taking the screw blanks from the carrier, and presenting them to the jaws, as specified.

The Woodworth Patent Suit in North Carolina Terminated.

Most of our readers, acquainted with planing machines, are probably aware that the heaviest suit brought under the Woodworth Patent has been pending in the Circuit Court of North Carolina for three years past: we mean the suit of Potter & Kidder vs. P. K. Dickinson & Co. Some of the ablest counsel in the country were retained in it, and twenty-five thousand dollars in the three years were expended by the parties in the preparation of the cause for a hearing. It was before the court at the last term, on a motion for an interlocutory injunction, and Mr. Justice Wayne ordered the complainants' bill to be amended as required by the answer, refused the injunction, and remarked that the pleadings on behalf of the defendants exceeded any for ability, and the great number of new points raised, that had ever fallen under his notice. A case of more importance to the country and to the patent law had never arisen, the defendant continually running the Gay machine, and the evidence covering everything known in relation to the Woodworth patent and all the planing machines in this and foreign countries. Having reached this crisis, the complainants proposed to dismiss the bill, each party paying their own costs—and thus has ended this vigorously prosecuted and most vigorously defended suit of any that has yet been brought under the Woodworth Patent.

French Patents.

A law somewhat similar to that about to be introduced into England, substituting stamps for the present system of patent right, has been passed in France. The French system does not, however, do away with the existing laws or patents, but leaves it at the option of the patentee to follow either method of protection as he likes, and to be subject to the fees of that alone. A law introducing stamps has, accordingly, been promulgated in France, which are divided into two classes, the one called "timbre marque," to protect the name or mark of the manufacturer, the other "timbre garantie," to protect his ownership of an invention. These stamps are to be made of various sizes, on paper and metal, of a circular form, with an empty space in the centre for the manufacturer's legal mark or signature; the former are to be sold to patentees at one per cent. on the price of the articles for which they are intended, and the latter ("timber garantie") at two per cent., and the counterfeiting of them will be punishable by law. The "Genie Industriel" calculates that this system, if generally adopted, would produce a revenue sufficient to pay more than half the annual budget of the country.

New Commissioner of Patents.

The appointment of Judge Mason, of Iowa, as Commissioner of Patents, is highly creditable to the new Administration. We have known the Judge for years, and know him to be a gentlemen eminently qualified for the post. In his own State no man is more deservedly popular among the people. He combines, what is not always the case, a clear and well disciplined intellect, with a good and benevolent heart.

In everything relating to the reforms and benevolent institutions of his State, Judge Mason has been prominently identified, so much so, indeed, that although one of the most prominent Jurists of the West, he has not accumulated a large share of this world's goods.

Such men deserve well, and we are rejoiced to see them filling distinguished places in the offices of the Government.

[The above notice of Judge Mason we copy with much pleasure from the "Ohio Farmer," an excellent paper published by Thomas Brown, Cleveland, Ohio.

Principles of Patents.--Important Decision.

It is well known to our readers what ground we have taken in respect to the *principles* of patents, and how we have endeavored to set so many legal gentlemen right in respect to the nature of inventions. It has always appeared to us that many of our judges and men of legal fame have had very confused ideas of what a principle is. The decision made by Judge Kane, on which we freely commented on page 67, Vol. 7, Scientific American, and the letter of the Hon. A. Kendall, page 170, this volume, present examples of what we call "confused ideas and incorrect views respecting *an art* and *a principle*, as connected with patents and inventions."

We have now before us a certified copy of a decision of the U. S. Supreme Court, made at the last December term, and which was referred to in Mr. Kendall's letter, which is in exact accordance with the doctrines we have taught, and the views set forth by us from time to time respecting the principles of patents. The case is one of error—an appeal taken from the Court of the Southern District of New York, in the case of a patent for manufacturing lead pipe.

In 1837, John and Charles Hanson, of England, obtained a patent for an alleged improvement in the manufacture of lead pipe, and in 1841 a patent for the same was taken out in the United States, which was assigned to Messrs. H. B. & B. Tatham, and afterwards G. N. Tatham was admitted a partner. A re-issue of this patent was granted in 1846, and a suit was commenced in New York against Thomas Otis Le Roy and David Smith for infringement of the same, and damages of $20,000 claimed. The defendants pleaded not guilty and asserted that the invention was not new, that the machinery had been described before and was not patentable.

The Court in charging the jury in the case said:—"There can be no doubt if the combination of the machinery claimed is new, and produces a new and useful result, it is the proper subject of a patent, the result is a new manufacture. And even if the mere combination of the machinery in the abstract is not new, still if used and applied in connection with the practical development of a principle newly discovered producing a new and useful result, the subject is patentable." [We request the attention of Mr. Kendall to these sentiments.] "In this view the improvement of the plaintiffs is the application of a combination of machinery to a new end, to the development and application of a new principle resulting in a new and usetul manufacture. In the view taken by the court in the construction of the patent, it was not material whether the mere combination of machinery presented by the defendants as having been described before was similar to the combination of the Hansons, because the originality did not consist in the novelty of the machinery, but in bringing *a newly discovered principle* into *practical application* by which a useful article of manufacture is produced." To these charges of the court the defendants took exceptions, and carried the case to the U. S. Supreme Court. Judge McLean delivered the opinion of the Court, to which we request the attention of our readers interested in patents, so as to take particular notice of the opinion of the U. S. Supreme Court, and see how it accords with the views we have always expressed in respect to patent principles. The court said:—

"The word Principle is used by elementary writers on patent subjects, and sometimes in adjudications of Courts with such a want of precision in its application as to mislead. It is admitted that a principle is not patentable. A principle in the abstract is a fundamental truth, an original cause, a motive; these cannot be patented, as no one can claim in either of them an exclusive right. Nor can an exclusive right exist to a new power should one be discovered in addition to those already known. Through the agency of machinery a new steam power may be said to have been generated, but no one can appropriate this power exclusively to himself under the patent laws. The same may be said of electricity, and of any other power in nature, which is alike open to all and may be applied to useful purposes by the use of machinery. In all such cases the processes used to extract, modify, and concentrate natural agencies constitute the invention. The elements of the power exist, the invention is not in discovering them, but in applying them to the useful objects.—Whether the machinery used be novel or consist of a new combination of parts known, the right of the inventor is secured against all who use the same mechanical power or one that shall be substantially the same. A patent is not good for an effect or the result of a certain process, as that would prohibit all other persons from making the same thing by any means whatever. This, by creating monopolies, would discourage arts and manufactures against the avowed policy of the patent laws.

A new property discovered in matter, when practically applied in the construction of a useful article of commerce or manufacture is patentable, but the process through which the new property is developed and applied must be stated with such precision as to enable an ordinary mechanic to construct and apply the necessary process. This is required by the patent laws of England and of the United States, in order that when the patent shall run out the public may know how to profit by the invention."

[Let our readers examine page 67, Vol. 7, Scientific American, and pages 170, and 214, present Vol. Scientific American, and compare the above with our views therein expressed.]

"In the case before us the court instructed the jury that the invention did not consist in the novelty of the machinery but in bringing *a newly discovered principle into practical application*, by which a useful article of manufacture is produced, and wrought pipe made as distinguished from cast pipe." A patent for leaden pipes would not be good, as it would be for an effect, and would consequently prohibit all other persons from using the same article however manufactured." We request the attention of Mr. Kendall to the last paragraph, the decision is just such as that which his letter states the "*court did not make.*"

The instructions of the New York Circuit Court were totally at variance also with the claims of the patent, for the claim is as follows:—"The combination of the core, bridge, or guide piece, the chamber and the die when used to form pipes of metal under heat and pressure in the manner set forth," and respecting this the U. S. Supreme Court decision says:—"The combination of the machinery is claimed through which the new property of lead was developed as the part of the *process* in the structure of the pipes. But the jury were instructed "that the originality of the invention did not consist in the novelty of the machinery, but in bringing a newly discovered principle into practical application. The patentees claimed the combination of the machinery as their invention in part, and no such claim can be sustained *without establishing its novelty*; a newly developed property of lead was not in the case."

The instruction of the Circuit Court, New York, was ruled to be wrong, and the judgement reversed. We would state that the opinion of the U. S. Supreme Court, as set forth above, accords with that of the most eminent jurists in patent laws, and the instructions of the court of New York in this case, and the decision of the court in Philadelphia in the Morse and Bain case, excited great surprise in us. "Is it possible," we said, "that we have any judges so defective in knowledge respecting patent laws." Mr. Justice Buller, as quoted by Webster, says in reference to the question of patent principles. "The method and mode of doing a thing are the same, and I think it impossible to support a patent for a method without carrying it into effect and produce some new substance. But here it is necessary to inquire what is meant by a principle reduced to practice. It can only mean *a practice founded on a principle.*"

A line of propellers has been started to carry Cumberland coal from Baltimore to New York.

A Mechanics' Institute is about to be established in Louisville, Ky.

© 1853 SCIENTIFIC AMERICAN, INC

TO CORRESPONDENTS.

M. W., of Pa.—The $5 received from you will pay Mr. F.'s subscription one year and balance your account with us.

A. F. R., of N. J.—Why not employ Watt's "steam jacket" at once; your plan could not be patented.

N. C., of Ohio—Yours will receive attention.

J. S., of N. Y.—We have never seen a water gauge for steam boilers like the one you have described. It appears to be patentable.

J. S., of Iowa—Your plan for making self-raising flour is different from that which is patented, and we think it is a good plan and patentable; your other plan, so far as we are able to judge, is also patentable.

R. F. F., of Boston—Your plan for heating cities and villages with hot air, is feasible; it has been proposed to us a number of times. The pipes would have to be made of some non-conducting material

G. J. H., of Ohio—Lead and zinc have both been used for milk pans, but we advise you to use neither; tin is the safest; zinc is so easily oxydized that it does not last long, but the pure white oxyde of zinc is not, strictly speaking, poisonous.

D. H., of Ct.—An endless chain of buckets, employed as a water-wheel, is an old device and could not be secured; several references can be given. See Ree's Cyclopedia, or Vol. 3, Sci. Am.

A. C. S., of N. Y.—We do not know about the boiler iron.

G. H, of Va.—Your proposition to light lamps by electricity is not new.

J. H., of ——.—We don't see that there is any loss by the stationary guides, if a man lifts 100 lbs. two feet high, with his feet on a fixed platform, he will only lift it one foot high, if his feet are placed on a movable platform, so there is no gain nor loss; your plan is new to us, however.

G. B., of Wis.—Your application is a long distance behind; write to the Patent Office; a reefing paddle wheel is not new; we published one in Vol. 1 of our paper; we could not give an opinion about the stuffing box.

D. S., of Iowa—The oil of sun-flower, has been tested, to our knowledge, in painting; it is not as good as linseed oil; for machinery it is far inferior to sperm; we do not know how it answers for illumination.

P. Van S., of N. Y.—Your views about the locomotive are correct in one sense; the oscillating is caused by the cylinders being placed outside, and the rapid repeated strokes of the pistons in conjunction with the velocity of the wheels; by the description of your horse-power we cannot get a proper idea of its value. Simplicity in machinery is the grand desideratum.

S. S., of N. Y.—We have received your letter describing an improvement in tables; it is carefully filed among our confidential papers.

C. W. Cooke, Waterloo, N. Y.—We find by reference to your letter that it was written seven thousand instead of seven hundred thousand pounds of wool; quite a difference.

R. R., of Pa.—Your plan, for propelling machinery is absurd and cannot be made to operate to any advantage whatever; no patent could be obtained.

A. S. P., of N. C.—Your subscription expires with No. 43; all the power you can obtain from your wheel, is just the measure of force derived from the velocity and weight of the water which you call leakage.

C. M., of Md.—Yours could not appear this week.

J. S. B. of Ohio—No. 25 of the Scientific American cannot be furnished. The sketches of your alleged improvement in the steam engine have been carefully examined. The arrangement is new so far as we know, and it is our opinion that a patent can be obtained, of this however there is no certainty, so much having already been done. You had better experiment with it, and if possible ascertain its value.

C. R., of Vt.—We wish it distinctly understood that buying and selling or speculating in patents is strictly avoided in this office.

W. M. L., of La.—Wilson's Sewing Machine has not been adapted to sewing leather, but for fine work, linen, and cotton, it excels, in our opinion, any other machine in use; Elias Howe's machine is adapted to sewing leather, his office is at 205 Broadway, N Y.

M. C., of Va.—Patentees can always have good engravings of their inventions executed from the Letters Patent, by sending them to this office; it is for the interest of every patentee to have his invention illustrated in a journal of wide circulation, devoted to mechanical and scientific matters.

R. E., of N. Y.—There is nothing new in your invention.

C. R., of N. Y.—It is doubtful about your being able to hold a claim to a combination, as the devices seem not to depend upon each other.

J. T., of Troy—Yours will appear next week.

Money received on account of Patent Office business for the week ending Saturday, April 2 :—

L. B. A., of Pa., $30; H. G. R., of Tenn., $5; C. D. B., of Ct., $25; G. G., of N. Y., $15; A. H. R., of Pa, $55; J T. D., of N. Y., $60; O. S. J., of Ct., $20; A. & S., of N. Y, $8, W. B., Jr., of N. Y., $475; T. L. J., of Miss., $60; R. F., of Ct., $25; D. T., of N. Y., $25; T. S. G., of N. J., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday April 2 :—

H. G. R., of Tenn.; E. V., of N. Y.; D. T., of N. Y.; C. D. B., of Ct; T. S. G., of N. J.; A. M. S., of Ala.; O S J., of Ct.; F. F., of N. Y.; A. & S., of N. Y.; H. G. DeW., of N. Y.; W. Z, of Ill.; E. F., of Ct.; A S. N, of Pa.; R. F., of Ct.

ADVERTISEMENTS.

STAVE MACHINERY—We manufacture the improved Mowry Stave Machine for slack work, cutting, dressing, and jointing, at one operation, without any handling of the stave until it is finished, after you place the bolt of wood upon the feeding carriage. The machine feeds itself, cutting, dressing, and jointing in a finished and uniform manner 80 to 100 staves a minute. Any kind of timber fit for a stave may be used, even such as could not be rived, as elm, hickory, beach, &c. The cost of running the machine need not exceed, if it equals, 50cts per M, for cutting, dressing, jointing, removing, and piling up, where a machine is kept steadily at work. For machinery and rights in the State of New York, apply to CHAS. MOWRY, Auburn, N. Y.; for machinery and rights elsewhere, to the subscribers, GWYNNES & SHEFFIELD, Urbana, Ohio. 30tf

WANTED—A situation as Superintendent of a Machine Shop, or of the locomotive power department on a railroad, by a capable man of 16 years' practical experience on locomotive engines, and who is a proficient draughtsman. Address "E T. S.," care of V. B. Palmer, Newspaper Agent, Scallay's Building, Court st, Boston. 30 2*

T. J. SLOAN'S PATENT HYDROSTAT—For the Prevention of Steam Boiler Explosions. The undersigned having made extensive arrangements for the manufacture of these machines, are now prepared to receive orders for the immediate application of the same to boilers of every description. They have endeavored to place the instrument within the reach of all, by selling it at a very low price. the cost of one horse-power being only $20, five horse-power, $30, and so on, according to the capacity of the boiler. SLOAN & LEGGETT, Proprietors and Manufacturers, foot of East 25th st, New York. 30tf

WANTED—In an Architect's Office, in this city, two pupils to learn the business. For further particulars address EDSON & ENGELBERT, Architects, No. 85 Nassau street, New York. 30 2*

WHEELER, WILSON, & Co.—Watertown, Ct., proprietors and manufacturers of Allen B. Wilson's Patent Stitching Machine. Patented June 15, 1852, it can be seen at the Company's Office, 265 Broadway, New York. 30 20*

PALMER'S PATENT LEG—Manufactured by Palmer & Co., at 5 Burt's Block, Springfield, Mass., for New England and New York State, and 376 Chestnut street, Philadelphia; in every instance of competition in the Fairs of the various Institutes of this country, has received the highest awards as "the best" in mechanism, usefulness, and economy. At the "World's Fair," London, 1851, in competition with thirty other varieties of artificial legs (by the best artists in London and Paris), it received the Prize Medal as the best.
25 20* (16e3w)

CHILDS, TAINTER & CO., Worcester, Mass., Builders of Daniel's Planers, with Read's feed motion, and J. A. FAY & CO's. celebrated Woodworking Machinery. 24 8*

NOTICE TO FOUNDRIES—The subscriber informs his patrons and the public that he is prepared to furnish FACINGS of every description fo Foundry purposes, at the shortest notice and on the most reasonable terms. Facings delivered in Boston free of charge. Orders directed to him at Neponset, Mass., will meet with prompt attention.
25 4eow* CHARLES ALDEN.

MACHINE FOR MAKING RAILROAD Chairs—Having built one of my patent machines for making Railroad Chairs, and operated it in presence of several scientific mechanics, who pronounce it the most perfect machine ever made for the purpose. I am anxious to sell rights upon reasonable terms; 4000 perfect chairs can be made in one day, with only one-third the usual labor. ROBERT GRIFFITHS, Newport, Ky., opposite Cincinnati. tf

ALDEN'S PATENT FAN BLOWER.—FOR Foundries, Smitheries, Rolling Mills, Steamboats, Ventilation, &c These Blowers possess many advantages over those of other construction, they will produce a stronger blast with less power, make less noise, and are less liable to get out of order, they are made entirely of metal, of the best material and workmanship. A printed report of a trial of them will be sent to those wishing it, by address ing the subscriber. Also Birkinbine's Patent Improved Hydraulic Ram and Force Pump. J. B. CHICHESTER, Agent, 338 Broadway, N. Y. 29 2*

ENGINEERING—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers, and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Taber's Water Gauge. Sewall's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc. etc.
CHARLES W. COPELAND,
29 13* Consulting Engineer, 64 Broadway.

SAND PAPER, GLUE—Excelsior Sand and Emery Paper. ABBOT'S Manilla Sand and Match Papers. Emery Cloth, Emery, Emery Grit, Pumice Stone ground and in lump, of very superior quality; also Glue of all grades, and in quantities to suit purchasers at the lowest manufacturers' prices, for sale by WILLIAM B. PARSONS, 284 Pearl street.
24 8*

BLACK LEAD CRUCIBLES—The subscriber is now manufacturing and keeps on hand an assortment of the above crucibles for steel melting, brass and other metal workers, which are warranted equal to any now in use. Orders respectfully solicited by DANIEL ADEE, Agent, 107 Fulton street, N. Y. 27 4*

CLOCKS FOR CHURCHES, COURT HOUSES AND OTHER PUBLIC BUILDINGS, Time-Pieces for Session and Vestry Rooms Hotels, Rail-Joads etc.; Regulators for astronomical purposes, Jewellers, and others, when the most perfect time is desired. The improvements introduced by the subscribers, enable them to warrant an accuracy of time-keeping, unequalled (so far as they can learn) in Europe or America. Glass dials, for illuminating and other kinds, furnished. Address SHERRY & BYRAM, Oakland Works, Sag Harbor, Long Island.
"At the Oakland Works of Sherry & Byram there are made some of the finest clocks in the world."
—[Scientific American. 19 13eow

TO ARTISTS, DESIGNERS, &c., one hundred dollars premium.—The government of the Massachusetts Charitable Mechanic Association having determined to procure a new diploma to be used at the Exhibition the present year, hereby offer a premium of one hundred dollars for the best original design of one Artists and others who may be disposed to compete, will please send their drawings to the secretary on or before Saturday the thirtieth day of April next. Each drawing must have some mark upon it, and must be accompanied by a sealed envelope, bearing a similar mark, and containing the address of the party sending it. For the design which shall be adopted by the executive committee the above premium will be paid. The other designs will be returned to their respective owners on demand. Any further information may be obtained by application to the Secretary. In behalf of the Government, FRED. H. STIMPSON, Secretary.
Boston, Feb. 23, 1853. 29 3*

WOODBURY'S PATENT PLANING Machines—I have recently improved the manufacture of my Patent Planing Machines, making them strong and easy to operate, and am now ready to sell my 24 inch Surfacing Machines for $700, and 14 inch Surfacing Machines for $650 each. I will warrant, by a special contract, that ONE of my aforesaid machines will plane as many boards or plank as two of the Woodworth machines in the same time, and do it better and with less power. I also manufacture a superior Tonguing and Grooving Machine for $350, which can be either attached to the Planing Machine, or worked separately. JOSEPH P. WOODBURY, Patentee, Border st, East Boston, Mass. 29tf

THE NEW HAVEN MANUFACTURING Company, New Haven, Conn., having purchased the entire right of E. Harrison's Flour and Grain Mill, for the United States and Territories, for the term of five years, are now prepared to furnish said mills at short notice. These mills are unequalled by any other mill in use, and will grind from 20 to 30 bushels per hour of fine meal, and will run 24 hours per day, without heating, as the mills are self-cooling. They weigh from 1400 to 1500 lbs., of the best French burr stone, 30 inches in diameter: snugly packed in a cast-iron frame, price of mill $200, packing $5. Terms cash Further particulars can be had by addressing as above, post-paid, or to S. C. Hills agent N. H. M. Co., 12 Platt st, N. Y. 28tf

THE NEW HAVEN MANUFACTURING CO. No. 2 Howard st, New Haven, Ct., are now finishing 6 large Lathes, for turning driving wheels, and all kinds of large work; these lathes weigh 9 tons, and swing 7 1-3 feet, shears about 16 feet long. Cuts and further particulars can be had by addressing as above, post-paid, or to S. C. Hills, agent N H. M. Oo., 12 Platt st, N. Y. 28tf.

TO SASH OR CABINET MAKERS ABOUT to commence business.—A couple of young men acquainted with working sash or cabinet machinery possessing a small capital can hear of a good chance for business in a large and flourishing city, where there is no competition, and prices from 50 to 100 per cent higher than in New York or Boston. Address J. E. TURNBULL, Saint Johns, New Brunswick. 28 4*

BOSTON BELTING COMPANY—No. 37 Milk street, Boston, Manufacturers of Machine Belting, Steam Packing, Engine and Conducting Hose, and all other articles of Vulcanized India Rubber, used for mechanical and manufacturing purposes.
28tf

PORTABLE STEAM ENGINES—The subscriber is now prepared to supply excellent Portable Engines, with Boilers, Pumps, Heaters, etc., all complete, and very compact, say 1, 2, 2 1-2, 3, 4, 6, 8, and 10 horse-power, suitable for printers, carpenters, farmers, planters, &c, they can be used with wood, bituminous, or hard coal; a 2 1-2 horse engine can be seen in store, it occupies a space 5 feet by 3 feet, weighs 1500 lbs., price $240; other sizes in proportion. S. C. HILLS,
27eotf Machinery Agent, 12 Platt st, N. Y.

THE PROPRIETORS OF JAMES RENTON'S Patent, for the manufacturing of wrought-iron direct from the ore, are desirous of introducing the invention generally, and invite parties who may wish to negociate for rights for States and counties, or for furnaces, to make immediate application, and to visit the works at Newark and examine for themselves; they are disposed to make liberal arrangements with responsible parties who make an early application. Applicants for rights in the State of New Jersey may address Hon. J. M. Quinby, President of the American Iron Co. Inquiries or application for other States may be made to the subscribers. The furnace which is now in operation at the American Iron Co's works, corner of Parker and Passaic sts., Newark, N. J., is attracting considerable interest. Gentlemen from all parts of the county have visited the works, examined the operation, and express the highest commendation of it. JAMES RENTON, A. H. BROWN, Proprietors, Newark, N. J. 26 5*

LEE & LEAVITT—Manufacturers of every description of Cast Steel Saws, No. 53 Water street, between Walnut and Vine, Cincinnati O. 27 6m*

SPILLARD AND DODGE—Arch Street Hall Brass Foundry, and manufactory of plumbers' brass; water, steam, and gas cock constantly for sale upon reasonable terms; 213 Arch street, Philadelphia, Pa. 25 8*

AARON KILBORN, No. 4 Howard st, New Haven, Conn., manufacturer of Steam Engines, Boilers, &c. Noiseless fan blowers and machinery in general. 25 10*

E. OLIVER'S WIRE WORKS—No. 25 Fulton st, corner of Water. Locomotive Spark Wire, Patent Self-Setting Revolving Rat Traps; a new invented enclosed Coal and Ash Separator, and Wove Wire of every description. 28 4*

COTTON MACHINERY—Of the most approved plans, from the best shops in the country:—drawings, specifications, and general arrangements for the machinery, furnished at the lowest rates, by W. B. LEONARD, and E. W. SMITH, 75 Merchants' Exchange, New York. 23tf

E. HARRISON'S UNEQUALLED FLOUR AND GRAIN MILLS—Their frames and hopper are cast-iron, and the stones French Burr, 30 inches in diameter; grinds of wheat and corn 20 bushels an hour, weighs fourteen hundred pounds. These mills, constructed upon a new principle, have become widely known, and are producing a revolution in milling. Cash orders promptly supplied, and the mills warranted to work in the best manner. The patentee offers $500 reward for any mill which will do an equal amount of work with the same power and dressing Made and for sale at the corner of Court and Union streets, New Haven, Conn, by
20 12* EDWARD HARRISON.

BEARDSLEE'S PATENT PLANING Tonguening and Grooving Machines—These celebrated machines have now been generally introduced in various portions of the United States. More than thirty are now in successful practical operation in the State of New York alone. As an illustration of the extent of work which they are capable of performing, with unrivalled perfection, it is sufficient to state that, within the last six months and a half, over five millions of feet of spruce flooring have been planed, tongued and grooved by one of these machines at Plattsburgh, N. Y., never running to exceed ten hours a day. The claim that the Beardslee machine was an infringement upon the Woodworth patent, has been finally abandoned; and after the proofs had been taken, the suit instituted by the owners of that patent was discontinued, and the whole controversy terminated on the first of November last. Applications for machines or rights may be made to the subscriber, GEO. W. BEARDSLEE, 57 State street, or No. 764 Broadway, Albany.
15tf

W. P. N. FITZGERALD, Counsellor at Law has recently resigned the office of principal Examiner of Patents, which he has held for many years, and is ready to assist, professionally, in the preparation and trial of patent causes before the U. S. Courts in any of the States, and before the Supreme Court of the United States. He also acts as Counsel in cases before the Patent Office, and on appeals therefrom, but does not prepare applications for Patents Office corner of E and 8th sts., Washington, D. C. 18tf

MACHINERY.—S. C. HILLS, No. 12 Platt-st. N. Y. dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's and Law's Planing machines; Dick's Presses, Punches and Shears; Morticing and Tennoning machines; Belting; machinery oil, Beal's patent Cob and Corn mills; Burr mill and Grindstones; Lead and Iron Pipe &c. Letters to be noticed must be post-paid. 27tf

A. B. ELY, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Munn & Co., Scientific American. 16tf

LEONARD'S MACHINERY DEPOT, 109 Pearl-st. and 60 Beaver, N. Y.—Leather Banding Manufactory, N. Y.—Machinists's Tools, a large assortment from the "Lowell Machine Shop," and other celebrated makers. Also a general supply of mechanics' and manufacturers' articles, and a superior quality of oak-tanned Leather Belting.
27tf P. A. LEONARD.

PAINTS, &c. &c.—American Atomic Drier Graining Colors, Anti-friction Paste, Gold Size, Zinc Drier, and Stove Polish.
QUARTERMAN & SON, 114 John st.,
27tf Painters and Chemists.

GEAR CUTTING—To order, executed with dispatch, straight, spiral, and bevel, at the machine shop No. 60 Vesey st, N. Y. G. W. WIGHT. 27 4*

BLACK LEAD CRUCIBLES and Melting Pots of any form, size and quality, made to suit customers, for 3 cents per number, and warranted equal to any of the kind manufactured in the world, by D. H. PURINTON, Somerset, Mass. 23 10*

PATENT DRAFT BOARDS—With extension scales, sheet fasteners, and T rule. See Reports of Worcester Fair, Maryland State Fair, &c. &c, with their awards. $10 complete. Sent by express. Address, post-paid, CHAMBERLIN & CO., Pittsfield, Mass. 16tf

FOR SALE—A new Horizontal Steam Engine, complete, with pumps 7 inch bore, 2 feet stroke, well suited for a saw mill; price $325; also one second-hand, nearly new, perpendicular, in iron frame work, complete, with pump and governor, 4 horse power, price, $175: all warranted to work well and of sound materials. Address C. SIMON, Louisville, Ky., (Main between 11th and 12th sts) 29 2*

THE TROY IRON BRIDGE CO. are prepared to erect Iron Bridges or Roofs, or any kind of bearing trusses, girders, or beams, to span one thousand feet or under, of any required strength, in any part of the country. Their bridges will be subjected to severe tests, and can be built for about the price of good wooden ones. Address BLANCHARD & FELLOWS, Troy, N. Y. 30 10*

NORCROSS ROTARY PLANING MACHINE,—Decided by the Circuit Court not to infringe the Woodworth Machine—I now offer my Planing Machines at a low price; they are not surpassed by any machines as to amount or quality of work. Tonguej ing and grooving machines also for sale, doing one or both edges as desired; 80 machines now in operation. Address me at Lowell, Mass.,
27 10* N. G. NORCROSS.

FALES & GRAY (Successors to TRACY & FALES), RAILROAD CAR MANUFACTURERS—Grove Works, Hartford, Connecticut. Passenger, freight, and all other descriptions of railroad cars and locomotive tenders made to order promptly.
1tf

C. B. HUTCHINSON'S PATENT STAVE Cutting Machines, the best in use, and applicable alike to thick or thin staves; also his Head Cutting and Turning, and Stave Jointing Machines.
For machines or territorial rights, apply to C B. HUTCHINSON & CO., Syracuse, N. Y. 9tf

J. D. WHITE'S PATENT CAR AXLE LATHES—also Patent Engine Screw Lathes, for boring and turning tapers, cutting screws, &c. We manufacture and keep constantly on hand the above lathes; also double slide Chuck and common Hand Lathes, Iron Planers, S. Ingersol's Patent Universal Ratchet Drill, &c. Weight of Axle Lathe, 5,500 lbs; price $600; Engine Serew Lathe, 1400 to 7,000 lbs; price $225 to $675, BROWN & WHITE,
27tf Windsor Locks, Conn.

COCHRAN'S CRUSHING MACHINE—Can be seen in daily operation in Thirteenth street, between 9th and 10th avenues. Parties in want of a machine for crushing and pulverizing quickly and cheaply Quartz Rock, Iron, Lead, Copper, and Silver Ores, and other mineral substances equally hard, are invited to witness the operation of these powerful and simple, but yet effective machines. For further particulars apply to E. & J. BUSSING & CO., No. 32 Cliff st., Y. N. 23tf

PATENT LAWS OF THE UNITED STATES, and information to inventors and patentees; for sale at the Scientific American office. Price 12 1-2 cents.

© 1853 SCIENTIFIC AMERICAN, INC

SCIENTIFIC MUSEUM.

White Sheep Skins for Door Mats.

Take two long-wooled sheep skins, and make up a strong lather of soap, the sign of proper strength is when the lather feels slippery between the fingers. When the lather is cold wash the skins carefully in it, squeezing them between the hands so as to take all the dirt out of the wool. When this is accomplished lift out the skins and wash them well in cold water until all the soap is extracted. Have a vessel of clean cold water ready, to which some alum and salt (about half a pound) which have been dissolved in a small quantity of hot water, are added, and the skins left to steep all night. They are taken out in the morning and hung over a pole to drip.—When all the alum water has dripped off they are spread out on a board to dry, and are carefully stretched with the hand from time to time. Before they are thoroughly dry a composition of two table spoonsfull of alum, and the same of saltpetre are ground to powder in a mortar or otherwise, and sprinkled carefully on the fleshy side of each skin. They are then placed the one on the top of the other, leaving the wool outside and hung upon a rack of slats, in a barn, shed, or dry airy place, for about three days, or until they are dry—they should be turned every day. After this they are taken down and the flesh side is scraped with a blunt knife and each skin trimmed for a mat. The flesh side may then be rubbed over with pipe clay, beat with a switch, and will then be found supple, of a beautiful white color, and fit for a door mat for a mechanic or a prince.

An Extensive Sugar Refinery.

The Grocers' Steam Sugar Refining Company are erecting an extensive and very substantial sugar refinery on the site of Swift's sugar-house, corner of Washington and Laight streets, in this city, which was destroyed by fire in May last. Its height will be 100 feet from the basement, and it will be divided into eleven stories. The building is to be entirely of brick and iron. The brick walls are 3½ in thickness at the bottom, and are laid in cement. The beams, floors, roof, door-cases, window-cases, doors, window sashes, shutters, inner-doors, and everything about the building which is not of brick and mortar is of iron. Heavy iron columns in rows sustain the floors. There will be fire-proof dividing walls through the building. The columns will weigh about 450 tuns. It will be erected so as to be conducted on a different working-principle from any other similar establishment in the United States. The company has been organized with a capital of $400,000. The building and machinery, aside from the site will probably cost about $300,000. Included in the machinery of the concern willl be four large vacuum pans—nine feet in diameter—two of them to be of iron and two of copper. Twelve large steam boilers will be used. They will employ about 300 men who will turn off about 1,000 bbls. of refined sugar per day—a business of about $100,000.

Great Fishing.

The "Dodge County (Wis.) Gazette," of a recent date, contains a most remarkable fish story. The story is, that during the month of January and February the lake at Horicon (Wis.) has been crowded with fishermen, and that some days from one to eight and ten tons per day, of pickerel, weighing from two to twenty-three pounds each, have been caught. There have been, some days, fifty or sixty persons spearing, loading, and drawing away. Above the village, and along the lake shore for a few miles, there were from thirty to forty tents on the ice, where people were taking fish from holes cut in the ice, all the time—some taking as high as two tons per day. The fish have sold at from $10 to $30 per ton, on the grounds, and as high as $6 per cwt. taken away.

The manufacture of the glass for the Crystal Palace has been undertaken by Messrs. Cooper & Beleher, of Camptown, N. J., who promise to supply the managers with 40,000 feet, one-eighth of an inch thick, enameled by a new process invented by Mr. Cooper, one of the partners. The process is very simple. The enamel is laid upon the glass in a fluid state with a brush, and after being dried is subjected to an intense heat, which vitrifies the coating, rendering it fixed and durable as the glass itself.

Manufacture of Matches.

About fifteen years ago, no less than six cents were paid for a box of matches, where now two such boxes can be purchased for one cent. The progress of science and art is perhaps more fully developed in the manufacture of many things called *small*, than in those things which embrace a more large and prominent space in the world's eye. The benefits—the comforts—which all classes, rich and poor, now enjoy from the manufacture of cheap friction lighting matches, is incalculable. On the wild prairie, or in the far-back woods, a match and a few dry sticks can kindle up a fire in a few moments, which will cook the wanderer's soup, or broil the hunter's venison steak. The days of flint, steel, and tinder-box, for kindling fires, are over; the incomparable friction match kindles up an hundred thousand fires in our city every morning, and lights up ten times that number of gas and other lights every evening. Frequent inquiries have been made of us, by letter, respecting the composition of matches, and we have furnished many practical receipts for that purpose during the past five years. A knowledge of the manufacture of matches, however, is still limited, and the following information on the subject, condensed from the "Cyclopedia of Useful Arts," newly published, we believe will be interesting to many of our readers:—

"The wood employed in the manufacture of luciters is the best pine plank, as free from knots as it can be procured. Each plank is cut across the fibres, by means of a circular saw, into 28 or 30 blocks, each measuring 11 inches long and 4½ wide, and 3 inches thick. These blocks are cut up into splints by a machine of simple but ingenious construction, which we will endeavor to explain in a few words. To the extremity of the horizontal arm of a crank is attached a frame, which reciprocates to and fro with the motion of the crank through a space of about four inches.—In this frame are fixed in a line some 30 or 40 lancets, with the points projecting upwards, and separated from each other by pieces of brass. The block of wood to be cut is inserted by the small end between uprights, and a lever placed upon it forces it down to a position such, that, as the lancet-points advance, the end of the wooden block is scored or cut in the direction of or parallel with the fibres, with as many lines as there are lancets. As the lancets are withdrawn by the motion of the crank, a scythe blade moving in a horizontal plane swings round, and cuts off the end of the block to the depth of the scores made by the lancets. The pieces thus cut off will evidently be four-sided splints square in section, supposing, as is the case, that the lancets are equidistant, and that the horizontal knife cuts exactly to the depth of the lancet scores. When the horizontal knife swings back, the block from which one layer of splints has thus been removed descends through a space equal to the depth of the section, the lancet-points again advance and recede, and the knife again does its work. In this way the cutting is carried on with such rapidity, that from 12 to 16 planks, each 12 feet long, 11 inches wide, and 3 inches thick, can be cut up into splints in a day of ten hours. Now, supposing 14 planks are thus cut up, and that each plank produces 30 blocks, we thus get 14×30=420 blocks.—Each block affords about 100 slices, which are cut off by the horizontal knife; but as each slide, before being cut off has been scored by 31 lancet-points, we thus get 420×100×31=1,302,000 splints; and as each splint makes two matches, we thus have 2,604,000 single match-splints per day. These bundles are piled up on the racks of a hot-room or drying-stove, and left for some hours until moisture is expelled.

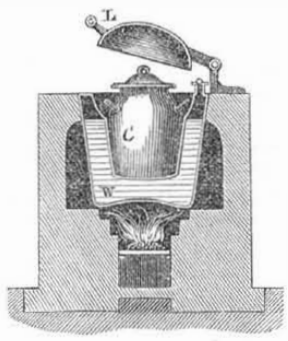
The next process is the "sulphuring."—The sulphur is melted in an iron pot over a stove, and when sufficiently fluid, the two ends of the matches are successively dipped, the matches being shaken after each dipping, in order to get rid of superfluous sulphur.—When the sulphur is dry the matches are ready for dipping in the phosphorous composition. Each manufacturer professes to have his own recipe, which he regards as the best, and, therefore, keeps secret. The ingredients are, however, well known to chemists; the principal one is phosphorus, which is made into an emulsion, with glue or gum arabic, the former being preferable, since gum absorbs moisture. Some makers use nitre, others fine sand; and all use coloring matter, which may be red ochre, red led, smalt, or artificial ultramarine.

The following proportions have been found to answer:

	Glue paste		Gum paste.
Phosphorus	2·5		2·5
Glue	2	Gum	2·5
Water	4·5		3
Fine sand	2		2
Red ochre	0·5		0·5
Vermillion	0·1		0·1

Instead of the last two coloring substances, 0·05 of Prussian blue may be used.

FIG. 1



When glue is used, it is of very inferior quality. It is broken into fragments and soaked for a few hours in cold water; then dissolved in a large glue pot, or vessel, C, figure 1, heated by a water bath, W. When it is perfectly fluid, and at the temperature of 212°, the copper is withdrawn, and placed in the circular opening of the frame, figure 2. The phosphorus is then added by degrees; it melts immediately and subsides, but is kept in agitation by means of the wooden stirrer, s, which is furnished at the lower part with projecting pegs, the object being, as the glue cools, to obtain an emulsion of phosphorus in a minutely divided state. The sand and coloring matters are added during the stirring. The paste is kept at the temperature of about 98°, sufficient to retain it in a fluid state by placing the vessel, C, in a water bath."

The author of this useful invention—the friction match as used, notwitstanding its novelty and its youth, is unknown; probably it was discovered by more than one person about the same time. A great number of such matches are made in New York, and the manufacture of them by one house is conducted upon a scale of liberality to the operatives which is exceedingly creditable to the heart of the manufacturer.

FIG. 2.

There are some matches which make a slight crackling noise when rubbed on a rough surface; the cause of this is the chlorate of potash; those which do not produce such explosions on a small scale, have none of that dangerous composition. The following composition is an excellent one for matches. 16 parts by weight of gum arabic; 9 parts of phosphorus; 14 parts of nitre; 16 parts of manganese, and 5 of smalt. These ingredients are mixed up with water into a thick paste, into which the sulphured ends of the matches are dipped, and then carefully dried. The manufacture of matches in Germany produced fearful diseases among the work-people, owing to the injurious effects of phosphorus, a remedy for this was discovered by Prof. Schrotter of Vienna, and was described on page 187, Vol. 7, Scientific American. The discovery was the rendering phosphorus *amorphous*; and a beautiful one it was in the department of chemistry.

Jewelry.

It is estimated that jewelry to the value of $3,000,000 is manufactured yearly in New York. There are sixteen large houses engaged in the business and several small establishments. One concern does business to the amount of $500,000 a-year, and employs about 150 men. The wages vary from 10 to 18 dollars, and some men earn as high as $25 and even $30 per week. The workmen are mostly Germans, though there are many French and Americans. The gold used is chiefly that of sovereigns; the refined gold from the bullion offices is likewise worked up.

LITERARY NOTICES.

LETTERS TO COUNTRY GIRLS—By Jane G. Swisshelm; 1 vol, 12mo., cloth, pp. 219; J. C. Riker, 129 Fulton st, New York. Some good advice, written in an homely manner, which we hope will be read by those for whom it is intended. Mrs Swisshelm is rather eccentric in many of her notions, and has often an abrupt manner in expressing herself, but there is much common sense in many of her odd sayings, and both country girls and city ladies will not do wrong to read over her letters, which contain much practical information and sound advice that may benefit the junior portion of her sex. The book is free from politics and those peculiar notions of which the authoress is so able an advocate.

PUTNAM'S MONTHLY—Vol. I., Nos. 1, 2, 3; 25cts. per number. Putnam & Co, New York. This magazine, of which we have received the first three numbers, promises to be an excellent monthly publication, and much judgment is displayed in catering for the varying tastes of all. Considering the vast quantity of reading contained in each number, the whole of which is original, it may be reckoned as the cheapest magazine ever published, and we prognosticate for the publishers an unparallelled success, if it continues to be edited with the same spirit as is evinced in the commencement.

HISTORY AND PRACTICE OF DAGUERREOTYPING—By A. Eisbee, published by L. Claflin, Dayton, O. A small work in the pamphlet form, containing instructions in Daguerreotyping, and which will be found very useful to the incipient operator. In addition to other matter, there are several receipts for making quick stuff, rouge, etc., by which the artist will be enabled to make up many chemicals, for which he is excessively overcharged by dealers and others. Every daguerreotypist ought to know how to make his own chemicals if he wishes to insure success.

MINNIFIE'S DRAWING BOOK—No 6 of this incomparable work on Elementary Mechanical Drawing, is now ready, and is for sale by Dewitt & Davenport, Tribune Buildings, this city.

AMERICAN RAILWAY GUIDE—Published by C. Dinsmore & Co. 22 Spruce street, New York. The fourth anniversary of this valuable publication commenced with the April number, which is now ready, containing the official time-tables of the railways throughout the United States.

THE GREAT ORATIONS OF DANIEL WEBSTER—For sale by Dexter & Brother, 43 Ann street. This publication contains five of Mr. Webster's greatest efforts, and is sold for 37 1 2 cts.

GRAY'S ELEGY ILLUSTRATED—A beautiful illuminated volume, containing this popular poem has just been issued from the Waverly Magazine Office, Boston, and can be had of Messrs. Dexter & Brother, 43 Ann st, N. Y.

MECHANICS

Manufacturers and Inventors.

A new Volume of the SCIENTIFIC AMERICAN commences about the middle of September in each year. It is a journal of Scientific, Mechanical, and other improvements; the advocate of industry in all its various branches. It is published weekly in a form suitable for binding, and constitutes, at the end of each year, a splendid volume of over 400 pages, with a copious index, and from five to six hundred original engravings, together with a great amount of practical information concerning the progress of invention and discovery throughout the world.

The Scientific American is the most widely circulated and popular journal of the kind now published. Its Editors, Contributors, and Correspondents are among the ablest practical scientific men in the world.

The Patent Claims are published weekly and are invaluable to Inventors and Patentees.

We particularly warn the public against paying money to Travelling Agents, as we are not in the habit of furnishing certificates of agency to any one.

Letters should be directed (post-paid) to
MUNN & CO.,
128 Fulton street, New York.

Terms! Terms! Terms!

One copy, for One Year	$2
" Six Months	$1
Five copies, for Six Months	$4
Ten Copies for Six Months for	$8
Ten Copies for Twelve Months,	$15
Fifteen Copies for Twelve Months,	$22
Twenty Copies for Twelve Months,	$28

Southern and Western Money taken at par for subscriptions, or Post Office Stamps taken at their full value.

© 1853 SCIENTIFIC AMERICAN, INC